Breakage Revenue- A Study of Prepaid Telecom services and Gift cards of Departmental Stores in Pune City

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Abstract:

Breakage revenue is a type of revenue which is hidden in the books of accounts of the companies but is definitely revenue earned or saved. The study tries to understand the quantum of such breakage revenues in mobile service sectors and its accounting treatment in the books of accounts. A study of Breakage revenue of telecom companies is undertaken on three major telecom players in India to understand in detail and two departmental stores to understand treatment and discloser of breakage revenue from unredeemed gift cards by departmental stores.

Key words-:

Breakage revenue, books of accounts, mobile service companies, departmental stores, gift cards

Statement of Problem:

The accounting standard on revenue recognition has not specifically laid down a standard for the accounting treatment of breakage revenue, however inference can be taken from IAS and compare with the actual treatment & discloser done by companies dealing with breakage revenue.

Methodology:

To conduct the research, breakage revenue data (unused prepaid services) is collected from 50 customers using prepaid services. The accounting treatment and discloser of breakage revenue part is understood by comparing IAS 18 on revenue recognition with the financial statements of the companies under study. To conduct the research both primary and secondary data collection methods is used.

Data collection:

Data is collected from 50 customers (30 using prepaid mobile services & 20 using gift cards) using structured questionnaire by random sampling method.Secondary data is collected from websites, financial statements, &chartered accountants to understand the actual treatment and discloser of breakage revenue in financial statements.

Conclusion:

Breakage revenue treatment is not defined in IAS 18 of revenue recognition; however the accounting treatment of the same is in line with revenue recognition standard with some variations with detailed study in the full paper.

Introduction:

Accounting standard-9 issued by the Institute of Chartered Accountants of India (ICFAI) dealing with 'Revenue Recognition' does not provide enough guidance in respect of the kind of complex transactions entered into by the telecom companies. In view of the same, the revenue recognition policy of the telecom companies has been questioned by the tax authorities. Talk time is provided to all the subscribers of prepaid services of telecom but the income received by the telecom service providers is calculated as pet the mercantile system of accounting. The amount received from the prepaid subscribers cannot be construed as income in the hands of the service provider till all obligations are done by the subscriber. In cases where the performance obligations are satisfied over time, the entity must recognize revenue overtime by measuring progress towards complete satisfaction of that performance obligation. In view of the same, as per Indian AS -115, the telecom companies shall now have to record the revenue to the extent of the service provided by them. Therefore, telecom companies, which are required to comply the Indian AS-115, need not recognize as revenue the amount attributable to services that have not yet been rendered by the telecom companies.

When a Card Issuer sells a prepaid stored-value card directly to a Consumer, it recognizes a liability for its obligation to provide the Consumer with the ability to purchase goods or services at a Content Provider. When the Consumer redeems the prepaid stored-value card at a Content Provider, the Card Issuer processes the card payment via a bank card network and the liability between the Card Issuer and the Consumer is extinguished. At the same time, the Card Issuer incurs a liability to the Content Provider. This liability is typically settled within a

few days through a card settlement process. A Card Issuer typically settles the liability net of a fee for its services.

Significance of the study-

In May 2014, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update (ASU) No. 2014-09, Revenue from Contracts with Customers, as subsequently amended, which resulted in the most significant revision to revenue recognition standards that GAAP has ever seen. One significant impact from ASU 2014-09 relates to the recognition of breakage revenue. Currently there is no Indian Accounting standard on accounting treatment and disclosure of breakage revenue. The study will highlight the importance of calculating, accounting, recording and disclosing breakage revenue in India. The use of the study is as under-

1. Quantum of breakage revenue from prepaid mobile services will be known
2. Quantum of breakage revenue from unredeemed gift cards will be known
3. Understanding the accounting treatment of the same
4. Know the discloser of breakage revenue in financial statement

Objectives of the study-

1. To study and understand breakage revenue concept and its implications

2. To study breakage revenue in context with mobile service companies in India.

3. To study breakage revenue in context with unredeemed gift cards of departmental stores in India.

6. To study accounting treatment of breakage revenue

7. To find out if breakage revenue is disclosed in the books of accounts.

Research Methodology-

Customers of various mobile service providers are contacted to know how many services do they use in pre-paid or post paid services and how much remains unused on an average in a month. Similarly customers using gift cards of departmental stores are contacted. Questionnaire and interview methods are used as primary methods. Also some senior officials of mobile service companies are contacted to know how they treat the unused services of customers which are already paid. Similarly accountant or departmental manager is interviewed to find out their method of treatment of breakage revenue from unredeemed gift cards. Primary data is conducted by studying total universe of mobile service users in Pune city. Samples are chosen on the basis of age and profession. Duration considered is the

use of services by customers over last one year starting from 1st Jan 2019 to 31st December 2020.

Data Collection-

Primary Data-

Data is collected by preparing questionnaire and framing questions relating to the problem statement and contacting 50 customers using various prepaid services. 30 customers of major mobile service companies in India are contacted such as 'Airtel', 'RelienceJio'&'Vodafone Idea' and 20 customers using departmental stores are contacted such as 'Big Bazaar' and 'Life style'.

Secondary Data-

Annual Reports of Telecom Companies, report of departmental stores, news papers, websites, magazines & government reports.

Universe & Sample Size-

There are 10 major players in telecom service providers & 15 major departmental stores in Pune city.

Sample size-

Name of service provider	Sample size
RelienceJio- Prepaid service card	10 customers
Vodafone Idea- Prepaid service card	10 customers
Airtel- Prepaid service card	10 customers
Big Bazaar- Prepaid gift card	10 customers
Lifestyle- Prepaid gift card	10 customers
TOTAL	**50 Customers**

Discussion & Results-
1. The table below depicts the response about the prepaid cards of the mobile service providers.

Table 2

Company/ Response	Reliance Jio	Idea / vodafone	airtel	Total
Which telecom service do you use	10	10	10	30

In telecommunications, breakage can occur in several ways. The key elements in maximizing revenue versus service via breakage are:

- Use of quanta (pay for more than you use).
- Bundling of mixed services (force purchase of other services).
- Expiry of purchased service (ideally expire monthly).
- Inflexibility of plans (with high charges for exceeding arbitrary fixed limits).
- Low flexibility in changing plans (e.g. upgrade for free, pay to downgrade).
- Low transparency of service usage and fees.
  - ➢ The table below depicts the response about the tariff plan used by respondents using RelienceJio services.

Table 2.1

RelienceJio	Prepaid tariff Plans with daily 1/2/3 GB data, 100/300 sms& unlimited calling						
Monthly Teriff Plans	Rs. 149	Rs. 399	Rs.349	Rs.198	Rs.398	Rs.448	Rs.299	Total
Unlimited calls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Sms per day	100	100	100	100	100	100	100	
Data pack per day	1.5GB	1.5GB	1.5GB	2GB	2GB	2GB	3GB	
Respondents using terrif	1	3	3	1	2	0	0	10

- ➢ The table below depicts the response about the tariff plan used by respondents using Vodafone services

Table 2.2

Vodafone/Idea	Prepaid tariff Plans with daily 1/2/3 GB data, 100/300 sms& unlimited calling									
Monthly plans with unlimited calls, sms and internet	Rs.169	.199	Rs.255	Rs.349	Rs.399	Rs.458	Rs.509	Rs.511	Rs.569	Total
Unlimited calls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Sms per day	100	100	100	100	100	100	100	100	100	
Data pack per day	1GB	1.5GB	2GB	3GB	1.5GB	1.5GB	1.5GB	2GB	3GB	
Respondents using terrif	1	1	0	2	3	2	1	0	0	10

> The table below depicts the response about the tariff plan used by respondents using Airtel services

Table 2.3

Airtel	Prepaid tariff Plans with daily 1/2/3 GB data, 100/300 sms& unlimited calling					Total
Monthly Teriff Plans	Rs.169	Rs.199	Rs.399	Rs.249	Rs.349	
Unlimited calls	Yes	Yes	Yes	Yes	Yes	
Sms per day	100	100	100	100	100	
Data pack per day	1GB	1.5GB	1GB	2GB	3GB	
Respondents using terrif	2	2	3	2	1	10

Respondents were enquired about the services used by them to know the unused services at the end of the validity.

Table 3.1

RelienceJio	Prepaid tariff Plans with daily 1/2/3 GB data, 100/300 sms& unlimited calling						
Monthly plans with unlimited calls, sms and internet	Rs. 149	Rs. 399	Rs.349	Rs.198	Rs.398	Rs.448	Rs.299
Do you use 100% unlimited free calls?	NO	NO	NO	NO	NO	NO	NO
Do you use all 100 sms per day?	NO	NO	YES	NO	YES	NO	NO
Do you use full internet pack per day?	YES/ sometimes	YES/ sometimes	YES/ sometimes	NO	NO	NO	YES/ sometimes

Interpretation-

Most of the customers of RelienceJio do not use free calls and sms services provided every day. Some customers also have balance internet packs unused per day.

Table 3.2

Vodafone/Idea	Prepaid tariff Plans with daily 1/2/3 GB data, 100/300 sms& unlimited calling							
Average Monthly plans with unlimited calls, sms and internet	Rs.169	Rs.199	Rs.255	Rs.349	Rs.399	Rs.458	Rs.509	Rs.511	Rs.569
Do you use 100% unlimited free calls?	NO	NO	NO	NO	NO	NO	NO	NO	NO
Do you use all 100 sms per day?	NO	NO	NO	YES	YES	NO	NO	NO	NO
Do you use full internet pack per day?	YES	YES/ sometimes	NO	NO	YES/ sometimes	NO	YES/ sometimes	NO	NO

Interpretation-

Most of the customers of Vodafone/Idea do not use free calls and sms services provided every day. Some customers also have balance internet packs unused per day.

Table 3.3

Airtel	Prepaid tariff Plans with daily 1/2/3 GB data, 100/300 sms& unlimited calling				
Monthly plans with unlimited calls, sms and internet	Rs.169 (1GB)	Rs.199 (1.5GB)	Rs.399 (1.5GB)	Rs.249 (2GB)	Rs.349 (2GB)
Do you use 100% unlimited free calls?	NO	NO	NO	NO	NO
Do you use all 100 sms per day?	YES	NO	YES	NO	NO
Do you use full internet pack per day?	YES/ sometimes	NO	YES/ sometimes	NO	YES/ sometimes

Interpretation-

Most of the customers of Airtel do not use free calls and sms services provided every day. Some customers also have balance internet packs unused per day.

Breakage Revenue of Telecom Service providers from prepaid cards

1. Outstanding calls from unlimited call offers

2. Outstanding sms from 100 sms per day

3. Outstanding data pack out of 1/2/3GB per day

Breakage revenue calculation-

Rate per minute- 0.10 per minute- source (Businessline PTI New Delhi published on 6th March 2019)

Rate per sms – Rs.0.50 per sms - source (Businessline PTI New Delhi published on 6th March 2019)

Rate per GB- Rs. 10 per GB- source (Businessline PTI New Delhi published on 6th March 2019)

This clearly shows that telecom service earns breakage revenue per customer per day. The accounting treatment and discloser is very important for telecom service companies

Breakage revenue from gift cards of departmental stores

➢ The table below depicts the response of the customers of the departmental stores under study

Table 4.1

Company/ Response	BIG BAZAAR	lifestyle	Total
Gift card of which store do you use	10	10	20

➢ The table below depicts the response of the customers regarding gift cards used by them

Table 4.2

Gift card denomination	Rs. 250	Rs. 500	Rs. 1000	Rs. 2000	Rs. 2500	Rs. 5000	Total
Customers of big bazaar store	3	5	1	0	1	0	10
Customers of lifestyle store	1	2	4	2	0	1	10

Number of customers

Figure 1 Gift card denomination

➢ The table below depicts details of unredeemed gift cards of customers of departmental stores under study.

Table 4.3

Gift card denomination	Rs. 250	Rs. 500	Rs. 1000	Rs. 2000	Rs. 2500	Rs. 5000	Total
Customers of big bazaar store	✔						250
Customers of lifestyle store		✔					500
Validity	2 months	3 months	1 year	1 year	1 year	1 year	-

✓ Shows unredeemed gift cards

Average Breakage revenue earned per customer:

250+500/2= Rs. 375

Recognition of Breakage Revenue

- The term "breakage" describes the revenue that retailers gain from un-redeemed gift cards or other prepaid services.
- In these cases, the company pockets the money paid for these items, without actually providing the service or item for which the customer or client initially paid.

- The Financial Accounting Standards Board (FASB) devised a new model for accounting for prepaid services and goods that addresses the breakage that goes along with selling these items.
- The FASB released an Accounting Standards Update in 2016, which required companies to comply with new guidelines before December 15, 2019.

Breakage revenue currently is recognized fewer than one of three methods, all of which were equally acceptable under current standards and industry practice:

1. **Released obligation method:** Under the released obligation method, the breakage revenue is not recognized until the company is legally released from its obligation (i.e., a gift card expiring).
2. **Remote Method:** Under the remote method, the breakage revenue is recognized once the probability of the redemption of a gift card becomes remote.
3. **Redemption Pattern Method:** Under the redemption pattern method, breakage revenue is recognized on a pro-rated basis determined by the redemption pattern of the outstanding gift cards redeemed.

Generally Accepted Accounting Principles (GAAP) and Unearned Revenue

- GAAP requires that revenue be recognized at the earliest point in the firm's operating cycle when it meets both of the following criteria: revenue is realized or realizable, and revenue is earned. If a firm receives cash in exchange for a promised future delivery of products or services, it records the increase in cash (an asset account) and the increase in unearned revenue (a liability account).
- When the product is delivered or the service is provided, the firm recognizes revenue (by crediting the revenue account) and reduces the liability, unearned revenue (by debiting the liability account). The transaction is recorded as follows:

Accounting treatment at the time of prepaid cards/gift cards is sold:

Account	Debit	Credit
Cash a/c	Total amount of sale of prepaid card/gift card	
Deferred Revenue a/c		Total amount of sale of prepaid card/gift card

Accounting treatment at the time of prepaid cards/gift cards isexpired/redeemed

Account	Debit	Credit
Deferred Revenue a/c	Deferred Revenue a/c	
Sales a/c		Amount of card used/redeemed
Breakage Revenue a/c		Amount of card unused/ unredeemed

Disclosure of Breakage Revenue by Telecom companies:

Complying with the new standard will have an impact on all companies that have the potential for breakage on unexercised customer rights. As such all companies that offer programs that allow for unexercised customer rights should start assessing the impact ASU 2014-09 will have on their revenue recognition policy. Public companies will be required to comply with the new standard for the year ending December 31, 2018, while most non public companies are provided an additional year requiring compliance for the year ending December 31, 2019

Disclosure of Breakage Revenue by stores issuing gift cards:

Unredeemed gift cards constitute a liability, this is self evident, but companies will differ on how exactly they will report this number. Most companies include unredeemed gift cards as a separate line item either on the balance sheet or in the supporting section where they explain their other liabilities section. Some companies lump unredeemed gift cards with their accrued expenses, their deferred revenue or their accounts payable. All are technically correct, but the first way is probably the best way to handle disclosure.

Old way	New Way
Generally, gift card breakage was recognized when the possibility of redemption was deemed remote. Most companies estimated this to be after two years of inactivity, at which time the unredeemed portion of the gift card would berecognized into income.	Under the new revenue standard, gift card package is determined by historical redemption rates and recognized in proportion to the actual redemptions of gift card, generally meaning redemption will be recognized much sooner

More often than not companies disclose their gift card policies in the way that Amazon.com does, with a simple paragraph in the notes:

> Included in "Accrued expenses and other" at December 31, 2010 and 2009 were liabilities of $503 million and $347 million for unredeemed gift certificates. We reduce the liability for a gift certificate when it is applied to an order. If a gift certificate is not redeemed, we recognize revenue when it expires or, for a certificate without an expiration date, when the likelihood of its redemption becomes remote, generally two years from the date of issuance.

> (Amazon.com Inc., 2010)

This statement does not recognize escheatment, does not describe the gift card program, does not describe how much breakage income was recognized in the year and does not reveal where breakage income is included in the Income Statement.

Two of the worst examples of companies disclosing their gift card sales information are Kohl's and Wal-Mart. Kohl's acknowledges that breakage exists but gives no details on how it accounts for it, nor where, and leaves out much of the other information discussed above:

> Revenue from gift card sales is recognized when the gift card is redeemed. Gift card breakage revenue is based on historical redemption patterns and represents the balance of gift cards for which we believe the likelihood of redemption by a customer is remote

> (Kohl's Corporation, 2010)

Wal-Mart on the other hand does not even acknowledge breakage. Wal-Mart doesn't even refer to its gift cards as gift cards, making it difficult for investors to parse how they handle gift cards. Instead it refers to them a "shopping cards":

> Customer purchases of shopping cards are not recognized as revenue until the card is redeemed and the customer purchases merchandise by using the shopping card.

> (Wal-Mart Stores, Inc., 2011)

Conclusion:

The new standard allows for a full retrospective application, which would result in a restatement of prior period financial statements, or a modified retrospective application, which would result in recording an adjustment to opening retained earnings during the period of initial application. Most companies are electing to implement under the modified retrospective application.Overall it would be safe to assume that based on the disclosure so far at least a quarter of the retailers would be affected by the changes in the breakage revenue recognition methods. The actual number is likely to be higher.

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Sample size-

Name of service provider	Sample size
RelienceJio- Prepaid service card	10 customers
Vodafone Idea- Prepaid service card	10 customers
Airtel- Prepaid service card	10 customers
Big Bazaar- Prepaid gift card	10 customers
Lifestyle- Prepaid gift card	10 customers
TOTAL	**50 Customers**

Discussion & Results-
1. The table below depicts the response about the prepaid cards of the mobile service providers.

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Sms per day	100	100	100	100	100	100	100	
Data pack per day	1.5GB	1.5GB	1.5GB	2GB	2GB	2GB	3GB	
Respondents using terrif	1	3	3	1	2	0	0	10

- ➤ The table below depicts the response about the tariff plan used by respondents using Vodafone services

Table 2.2

Vodafone/Idea	Prepaid tariff Plans with daily 1/2/3 GB data, 100/300 sms& unlimited calling									
Monthly plans with unlimited calls, sms and internet	Rs.169	.199	Rs.255	Rs.349	Rs.399	Rs.458	Rs.509	Rs.511	Rs.569	Total
Unlimited calls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Sms per day	100	100	100	100	100	100	100	100	100	
Data pack per day	1GB	1.5GB	2GB	3GB	1.5GB	1.5GB	1.5GB	2GB	3GB	
Respondents using terrif	1	1	0	2	3	2	1	0	0	10

> The table below depicts the response about the tariff plan used by respondents using Airtel services

Table 2.3

Airtel	Prepaid tariff Plans with daily 1/2/3 GB data, 100/300 sms& unlimited calling					Total
Monthly Teriff Plans	Rs.169	Rs.199	Rs.399	Rs.249	Rs.349	
Unlimited calls	Yes	Yes	Yes	Yes	Yes	
Sms per day	100	100	100	100	100	
Data pack per day	1GB	1.5GB	1GB	2GB	3GB	
Respondents using terrif	2	2	3	2	1	10

Respondents were enquired about the services used by them to know the unused services at the end of the validity.

Table 3.1

RelienceJio	Prepaid tariff Plans with daily 1/2/3 GB data, 100/300 sms& unlimited calling						
Monthly plans with unlimited calls, sms and internet	Rs. 149	Rs. 399	Rs.349	Rs.198	Rs.398	Rs.448	Rs.299
Do you use 100% unlimited free calls?	NO	NO	NO	NO	NO	NO	NO
Do you use all 100 sms per day?	NO	NO	YES	NO	YES	NO	NO
Do you use full internet pack per day?	YES/ sometimes	YES/ sometimes	YES/ sometimes	NO	NO	NO	YES/ sometimes

Interpretation-

Most of the customers of RelienceJio do not use free calls and sms services provided every day. Some customers also have balance internet packs unused per day.

Table 3.2

Vodafone/Idea	**Prepaid tariff Plans with daily 1/2/3 GB data, 100/300 sms& unlimited calling**							
Average Monthly plans with unlimited calls, sms and internet	Rs.169	Rs.199	Rs.255	Rs.349	Rs.399	Rs.458	Rs.509	Rs.511	Rs.569
Do you use 100% unlimited free calls?	NO	NO	NO	NO	NO	NO	NO	NO	NO
Do you use all 100 sms per day?	NO	NO	NO	YES	YES	NO	NO	NO	NO
Do you use full internet pack per day?	YES	YES/ sometimes	NO	NO	YES/ sometimes	NO	YES/ sometimes	NO	NO

Interpretation-

Most of the customers of Vodafone/Idea do not use free calls and sms services provided every day. Some customers also have balance internet packs unused per day.

Table 3.3

Airtel	**Prepaid tariff Plans with daily 1/2/3 GB data, 100/300 sms& unlimited calling**				
Monthly plans with unlimited calls, sms and internet	Rs.169 (1GB)	Rs.199 (1.5GB)	Rs.399 (1.5GB)	Rs.249 (2GB)	Rs.349 (2GB)
Do you use 100% unlimited free calls?	NO	NO	NO	NO	NO
Do you use all 100 sms per day?	YES	NO	YES	NO	NO
Do you use full internet pack per day?	YES/ sometimes	NO	YES/ sometimes	NO	YES/ sometimes

Interpretation-

Most of the customers of Airtel do not use free calls and sms services provided every day. Some customers also have balance internet packs unused per day.

Breakage Revenue of Telecom Service providers from prepaid cards

1. Outstanding calls from unlimited call offers

2. Outstanding sms from 100 sms per day

3. Outstanding data pack out of 1/2/3GB per day

Breakage revenue calculation-

Rate per minute- 0.10 per minute- source (Businessline PTI New Delhi published on 6th March 2019)

Rate per sms – Rs.0.50 per sms - source (Businessline PTI New Delhi published on 6th March 2019)

Rate per GB- Rs. 10 per GB- source (Businessline PTI New Delhi published on 6th March 2019)

This clearly shows that telecom service earns breakage revenue per customer per day. The accounting treatment and discloser is very important for telecom service companies

Breakage revenue from gift cards of departmental stores

➢ The table below depicts the response of the customers of the departmental stores under study

Table 4.1

Company/ Response	BIG BAZAAR	lifestyle	Total
Gift card of which store do you use	10	10	20

➢ The table below depicts the response of the customers regarding gift cards used by them

Table 4.2

Gift card denomination	Rs. 250	Rs. 500	Rs. 1000	Rs. 2000	Rs. 2500	Rs. 5000	Total
Customers of big bazaar store	3	5	1	0	1	0	10
Customers of lifestyle store	1	2	4	2	0	1	10

Number of customers

Figure 1 Gift card denomination

➢ The table below depicts details of unredeemed gift cards of customers of departmental stores under study.

Table 4.3

Gift card denomination	Rs. 250	Rs. 500	Rs. 1000	Rs. 2000	Rs. 2500	Rs. 5000	Total
Customers of big bazaar store	✓						250
Customers of lifestyle store		✓					500
Validity	2 months	3 months	1 year	1 year	1 year	1 year	-

✓ Shows unredeemed gift cards

Average Breakage revenue earned per customer:

250+500/2= Rs. 375

Recognition of Breakage Revenue

* The term "breakage" describes the revenue that retailers gain from un-redeemed gift cards or other prepaid services.
* In these cases, the company pockets the money paid for these items, without actually providing the service or item for which the customer or client initially paid.

- The Financial Accounting Standards Board (FASB) devised a new model for accounting for prepaid services and goods that addresses the breakage that goes along with selling these items.

- The FASB released an Accounting Standards Update in 2016, which required companies to comply with new guidelines before December 15, 2019.

Breakage revenue currently is recognized fewer than one of three methods, all of which were equally acceptable under current standards and industry practice:

1. **Released obligation method:** Under the released obligation method, the breakage revenue is not recognized until the company is legally released from its obligation (i.e., a gift card expiring).

2. **Remote Method:** Under the remote method, the breakage revenue is recognized once the probability of the redemption of a gift card becomes remote.

3. **Redemption Pattern Method:** Under the redemption pattern method, breakage revenue is recognized on a pro-rated basis determined by the redemption pattern of the outstanding gift cards redeemed.

Generally Accepted Accounting Principles (GAAP) and Unearned Revenue

- GAAP requires that revenue be recognized at the earliest point in the firm's operating cycle when it meets both of the following criteria: revenue is realized or realizable, and revenue is earned. If a firm receives cash in exchange for a promised future delivery of products or services, it records the increase in cash (an asset account) and the increase in unearned revenue (a liability account).

- When the product is delivered or the service is provided, the firm recognizes revenue (by crediting the revenue account) and reduces the liability, unearned revenue (by debiting the liability account). The transaction is recorded as follows:

Accounting treatment at the time of prepaid cards/gift cards is sold:

Account	Debit	Credit
Cash a/c	Total amount of sale of prepaid card/gift card	
Deferred Revenue a/c		Total amount of sale of prepaid card/gift card

Accounting treatment at the time of prepaid cards/gift cards isexpired/redeemed

Account	Debit	Credit
Deferred Revenue a/c	Deferred Revenue a/c	
Sales a/c		Amount of card used/redeemed
Breakage Revenue a/c		Amount of card unused/ unredeemed

Disclosure of Breakage Revenue by Telecom companies:

Complying with the new standard will have an impact on all companies that have the potential for breakage on unexercised customer rights. As such all companies that offer programs that allow for unexercised customer rights should start assessing the impact ASU 2014-09 will have on their revenue recognition policy. Public companies will be required to comply with the new standard for the year ending December 31, 2018, while most non public companies are provided an additional year requiring compliance for the year ending December 31, 2019

Disclosure of Breakage Revenue by stores issuing gift cards:

Unredeemed gift cards constitute a liability, this is self evident, but companies will differ on how exactly they will report this number. Most companies include unredeemed gift cards as a separate line item either on the balance sheet or in the supporting section where they explain their other liabilities section. Some companies lump unredeemed gift cards with their accrued expenses, their deferred revenue or their accounts payable. All are technically correct, but the first way is probably the best way to handle disclosure.

Old way	New Way
Generally, gift card breakage was recognized when the possibility of redemption was deemed remote. Most companies estimated this to be after two years of inactivity, at which time the unredeemed portion of the gift card would berecognized into income.	Under the new revenue standard, gift card package is determined by historical redemption rates and recognized in proportion to the actual redemptions of gift card, generally meaning redemption will be recognized much sooner

More often than not companies disclose their gift card policies in the way that Amazon.com does, with a simple paragraph in the notes:

> Included in "Accrued expenses and other" at December 31, 2010 and 2009 were liabilities of $503 million and $347 million for unredeemed gift certificates. We reduce the liability for a gift certificate when it is applied to an order. If a gift certificate is not redeemed, we recognize revenue when it expires or, for a certificate without an expiration date, when the likelihood of its redemption becomes remote, generally two years from the date of issuance.

> (Amazon.com Inc., 2010)

This statement does not recognize escheatment, does not describe the gift card program, does not describe how much breakage income was recognized in the year and does not reveal where breakage income is included in the Income Statement.

Two of the worst examples of companies disclosing their gift card sales information are Kohl's and Wal-Mart. Kohl's acknowledges that breakage exists but gives no details on how it accounts for it, nor where, and leaves out much of the other information discussed above:

> Revenue from gift card sales is recognized when the gift card is redeemed. Gift card breakage revenue is based on historical redemption patterns and represents the balance of gift cards for which we believe the likelihood of redemption by a customer is remote

> (Kohl's Corporation, 2010)

Wal-Mart on the other hand does not even acknowledge breakage. Wal-Mart doesn't even refer to its gift cards as gift cards, making it difficult for investors to parse how they handle gift cards. Instead it refers to them a "shopping cards":

> Customer purchases of shopping cards are not recognized as revenue until the card is redeemed and the customer purchases merchandise by using the shopping card.

(Wal-Mart Stores, Inc., 2011)

Conclusion:

The new standard allows for a full retrospective application, which would result in a restatement of prior period financial statements, or a modified retrospective application, which would result in recording an adjustment to opening retained earnings during the period of initial application. Most companies are electing to implement under the modified retrospective application.Overall it would be safe to assume that based on the disclosure so far at least a quarter of the retailers would be affected by the changes in the breakage revenue recognition methods. The actual number is likely to be higher.

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IMPACT OF COVID 19 PANDEMIC SITUATION ON INDIVIDUAL'S INVESTMENT, SAVING AND CONSUMPTION BEHAVIOR WITH REFERENCE TO PUNE CITY

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Abstract: COVID 19 has spread worldwide it has massive impact on the economy and individuals. It not only triggered health related emergency but badly shaken other sectors also in economy. Corona pandemic situation results in to nationwide lock down. The lockdown aids to curtail the cases of Corona in India. But it has impact on businesses and jobs of the people. The service industry like theaters, hotel & tourism, Gym, Gardens, Salon, Street Food seller and many allied businesses where entirely closed. Gradually Government have unlocked the many sectors. But it has affected income of individuals. This paper is intended to study the impact of Corona pandemic situation on savings and investment behavior of individual in India with reference to Pune City.
Keywords: COVID 19, saving and Investment Behavior, Individual.

Introduction:

COVID 19 pandemic situation has brought paradigm shift in all the activities of the individual. It has shaken the life of many individuals by different ways. COVID 19 has impact on the individuals saving and investment behavior worldwide. Individual makes investments and savings with different motives such as for emergency, retirement, down payment of house, getting interest vacations, children's education etc. There are numerous investment avenues where the individual can invest, further than some are traditional and contemporary avenues, low risk and high risk. While selecting the investment avenue individual has match with risk bearing with the risks associated with product. There are investments bearing higher risk but at the same time returns from such investments is higher.

In India due to Corona pandemic situation Government has declared lock down due to few cases reported in India. The outbreak of the Corona pandemic situation results in to crash of share market, decrease in income, many people lose their jobs. The lockdown also unfavorably affected service sectors like Gym, hotel & tourism and allied businesses, street food seller etc.

The present research intents to study the impact of COVID 19 situation on individual's Investment and Saving Behavior.

Literature Review

Rama Karmarkar (2020) the article researcher suggested that in this COVID pandemic situation prudent financial action should be taken for overall Financial well-being of an individual and his / her family. Also, in this situation, individual should set their short-term goals. The investment made by the individual should be sufficiently liquid to satisfy contingencies and short-term needs. According to researcher in this pandemic situation back up plan should be ready, individuals should opt for insurance, should reduce their expenses and use of credit card. This state has reverberated the need for adopting financial discipline and planning in the 'income earning' age of millennials.

Uma Shashikant (2020) The researcher in the article "New rules of personal finance: How COVID has changed income, spending, saving, investing" concentrated on how four pillars of household finances has affected due to COVID 19 pandemic situation. According to researcher risks to income are the most important. Due to cut down in pays, job lost and decrease in income, the spending's pattern has been changed, individual has reduced expenses on luxury. Individuals are spending's on essential needs instead of luxury as individuals want to save more as a precautionary motive. The next 12 months is about that examination that might define the new atmosphere and philosophy of individual in the spending, saving and investing pattern due to COVID19 pandemic situation.

Nilanjana Chakraborty (2020) The articles revealed that COVID 19 pandemic has changed the way of savings and borrowings of individuals due to toll on business, jobs and incomes. In the surveys conducted by Bank Bazar and India Lends, it has been observed that individual's perspective has been changed. Individuals become more cautious when their financial priorities are considered, their consumption is falling and individuals have given priority to saving investing and loan repayment. Even though situation is slowly normalizing individuals are more cautious which results in to change in consumer behavior. According to the survey conducted even though economic recovery begin, spending pattern will not be same as earlier mainly due to the impact of social distancing. The pandemic has redesigned the way individual organize the finances. According to researcher the financial effect of COVID-19 will have impact for some time, so varying spending, saving and investing habits to adapt to the post-COVID-19 world appears inevitable.

Surabhi Kumthakar, Dr. Varsha Nerlekar (2020) Analytical Study of Investment Patterns and Investment Preferences of Retail Investors Post COVID 19 research paper the research analyzed the impact of pandemic situation on investment preferences of people

in India. According to the study due to pandemic situation people wanted to invest in to debt funds instead of equity as to avoid risk. Also, people chosen more investment in mutual funds, fixed deposit and fixed interest-bearing securities. People preferred to invest in gold as risk of losing money is negligible. The impact of COVID 19 is enormous and the economy is going to take stretch to entirely recover from it. The investments industry also did not eyewitness a massive downfall but still the impact was noticeable. Since it is a global pandemic, the retrieval will be hard but retail investors need to have confidence and should not entirely shift to the traditional, safer investment avenues. The future of investment industry in India looks very promising and the observation of retail investors is also positive.

Sarbvir Singh (2020) COVID-19 impact: Managing personal finances in the middle of an emergency in this article focuses on two important aspects as to have a sound financial plan ready and individual should have three to six month's expenses in this situation. According to researcher individual should protect their family with insurance from any unanticipated incident. Individuals should continue to invest to build their long- term savings.

CA Shweta Jain (2020). in the research paper researcher analyzed the changes in individual income and spending's and savings as result of COVID 19. According the researcher impact of COVID 19 pandemic is enormous and the economy is going to take stretch to entirely recover from it. Due to industrial recession and preventive measures like lockdowns the spending's of individual has automatically reduced.

Aamir Sohail, Abid Hussain & Dr Qamar Afaq Qurashi (2020) In this research paper researcher conducted study regarding impact of COVID 19 on the investment decision of the individual in stock market. The study portrayed that economic and political stability is considered while electing the stock. During COVID 19 pandemic situation investors were carefully investing in to stock market. While making investment in stock market they considered their own experiences and brokers advices. However, risk factor is also measured by individuals while making investment in stock market.

Dr. Reena Khanooja (2020) In this article, Researcher analyzed the effect COVID 19 on the saving and investment habits of citizens of India. COVID- 19 has exaggerated mass of people worldwide and also lakhs of people lost their life. COVID 19 not only affected the health of people bust also had affected economy very badly. India took a hostile stance to reduce the spread of COVID 19 which affect the economy. Researcher emphasized on the role of saving and investment on life of the people. How investment and savings helped in savings and investment in COVID 19 pandemic situation.

Objectives of the study:

1. To analyze the impact of COVID-19 on the individual's saving and investment behavior.
2. To understand whether individuals are able to save their income in COVID 19 pandemic situation.
3. To identify the investment preferences of individuals in COVID 19 pandemic situation.
4. To analyze the impact of COVID 19 on income and spending's of individuals.

Scope of the Study:

1. The Comparative analyses of the behavioral pattern of the individuals taking into account their personal outlines like education, occupational status.
2. The study covers age group of people above 20 years old individuals.
3. The study covers individual's spread over a Pune City.

Limitations of the Study:

1. The study is conducted in the in Pune City.
2. The study also has methodological limitation in relation to the generalizability of the sample by using the sampling method.

Hypothesis:

1) There is no impact of COVID 19 pandemic situation on the saving and investment behavior of individual.
2) There is no association between income and consumption & investment behavior.

Research Methodology:

Descriptive research is used for the study investigation of investment and saving behavior among the individuals around Pune Descriptive research describes systematically a situation, problem, phenomenon, service or program or provides information about the living conditions of a community, or describes attitudes toward the issue and obtains information on the characteristics of a particular issue (Beri, 2009). For the research study investigation of certain groups depending on age, gender, education level, income, occupation is carried. So descriptive design is preferred.
The methodology and tools of analysis used for this study, where it is discussed on the targeted population, sample and sampling approach, through survey method.

Data Collection:

The data is collected by Primary and secondary data sources where in, the primary data is collected for this research study through survey method and the targeted population in Pune City and Secondary data for literature review and problem statement is gathered from journals, an online business magazine, online newspapers.

Sampling Units:
Sample consist of students, businessmen, professionals as well as salaried people from age group of 20 to above 50 years.

Sample Size:
100 respondents from different parts of the Pune city are approached for analyzing the investment and saving and spending's behavior of the individuals.

Data Analysis:

Particulars	Percentages
Yes	76.1
No	23.9
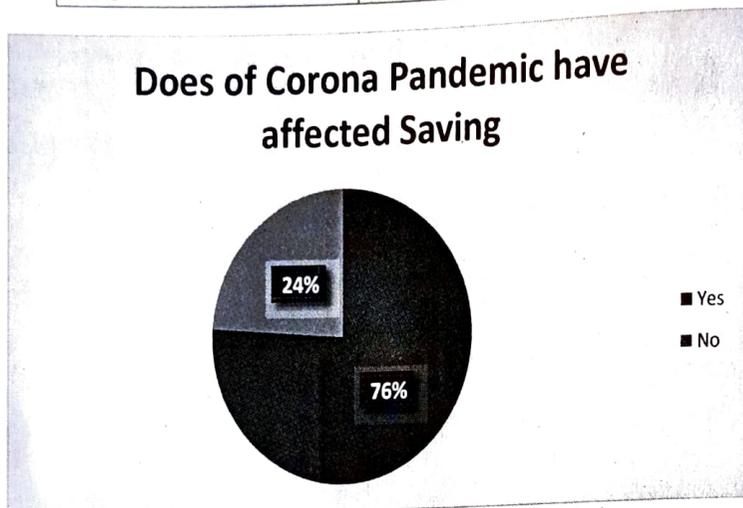
Graph 1 - Does of Corona Pandemic have affected Saving

As per Graph 76% respondents' savings are affected due to Corona pandemic situations and 24% respondents' do not have any impact on their saving and investment behavior.
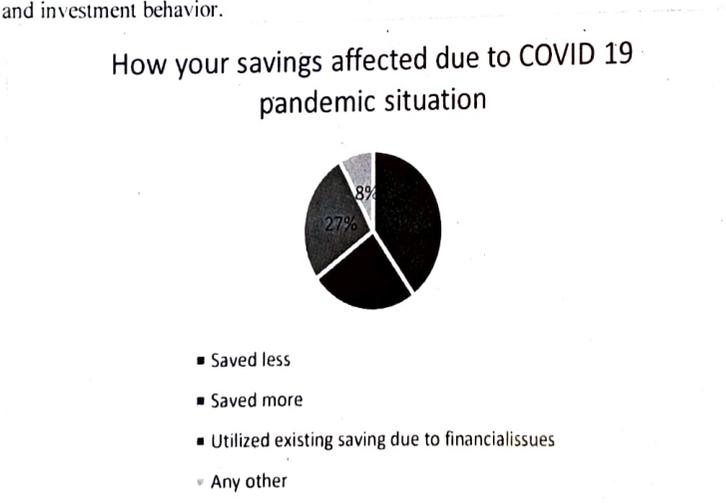
Graph 2 - How your savings affected due to COVID 19 pandemic situation

As per Graph 2 40% respondents have saved less, 27% have utilized their existing savings, 25% has saved more and 8% has not sure about their savings due to Corona Pandemic situation.

Particulars	Percentages
Decrease in hoteling expenses	64.3
Decline in outings (Day Trip)	65.7
Cut down in entertainment expenses	54.3
Reduced petrol and vehicle expenses	51.4
Due to work from home	27.1
Cut down in salary	30.0
Not Applicable	5.7

Impact of COVID 19 on spendings'of respondents'
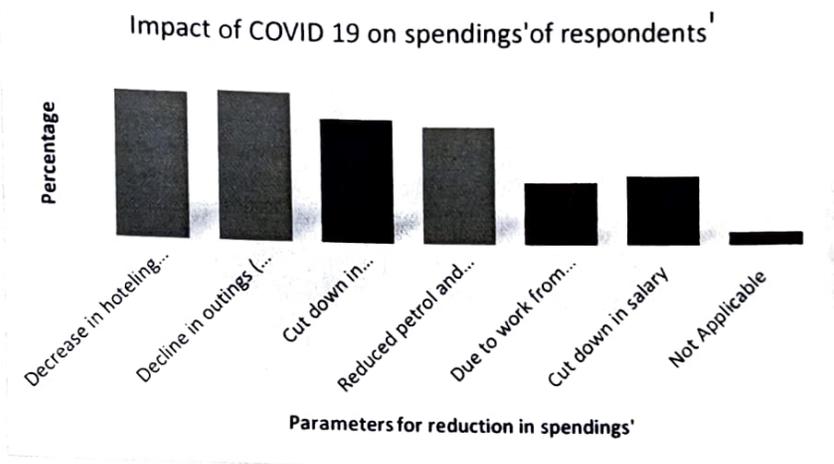
Graph 3- Impact of COVID 19 on spending of respondents'

As per Graph 3 64.3% of spending's of respondent's due to decrease in hoteling, 65.7% respondent's spending's are affected due to decline in outings, 54.3% due to cut down in entertainment expenses, 51.4% due to reduced petrol & vehicle expenses, 27.1% due to work from home, 30% due to cut down in salary and for 5.7% respondents' it is not applicable.

Particulars	Percentage
YES	77.5
NO	22.5

Have you availed any additional loan in this Corona Pandemic situation?

■ YES ■ NO
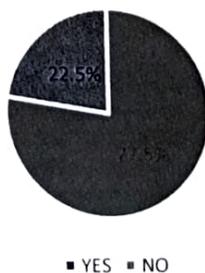
Graph 4 - Availing loan in COVID19 Pandemic situation by respondents'

As per Graph 4 77.5% of respondent's availed loan in COVID 19 pandemic situation and 22.5% of respondent's not availed loan in COVID19 pandemic situation.

Particulars	Percentage
Due to Financial Needs	61.1
Medical Treatment	11.1
To Pay Educational Fees	5.6
Investment in real estate	11.1
Any other	11.1
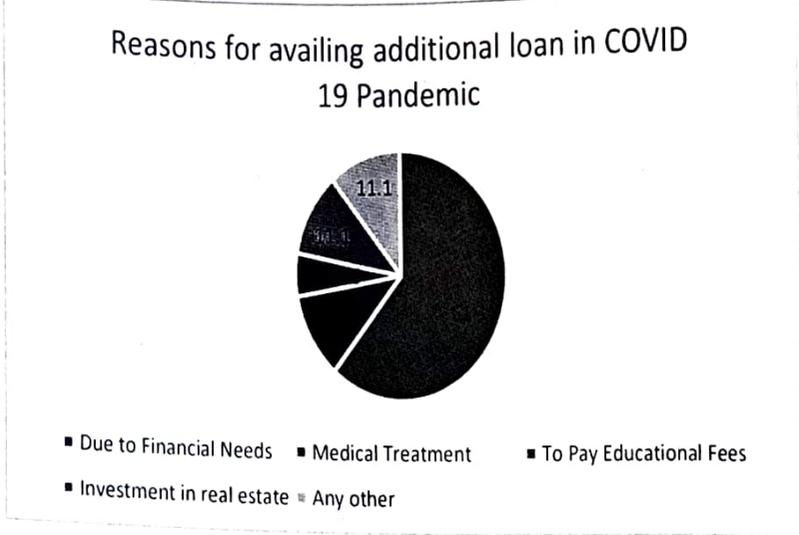
Graph 5 – Reason for availing additional loan in COVID 19 Pandemic

As per Graph 5 Maximum respondent's 61% availed loan due to financial needs, 11.1% due to medical treatment, investment in in real estate and other reason and 5.6% due to paying educational fees.

Particulars	Percentages
Due to Financial Crunches	25%
Due to cut down in salary	44%
Want to take advantage of moratorium	18.50%
Any other reason	12.50%
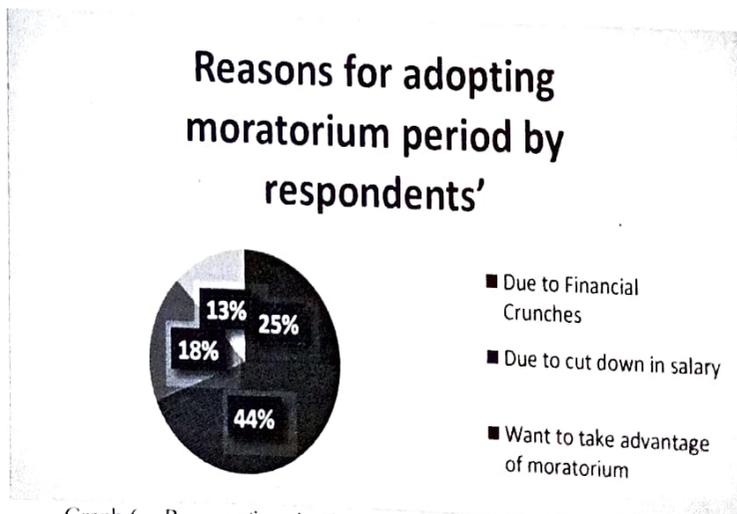
Graph 6 – Reasons for adopting moratorium period by respondents'

Graph 6 showing the reason for adopting moratorium period by respondents who have adopted same. Maximum respondent's 44% has adopted moratorium period due to cut down in salary. 25% due to financial crushes, 18% respondents want to take advantage of moratorium and 13% respondents' have adopted due to other reason.

Particulars	Percentages
Atmanirbhar Bharat	11
Reduction in Stamp duty to boost real estate	55
20% Top up on loan (ELSS) through financial institution	23
Any other	11

Opinion about Government Initiatives in Corona Pandemic situation

- Atmanirbhar Bharat
- Reduction in Stamp duty to boost real estate
- 20% Top up on loan (ELSS) throughfinancial institution
- Any other
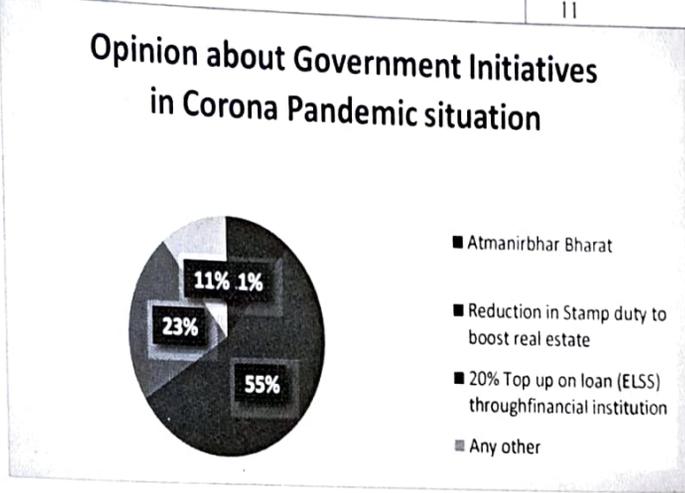
Graph 7 – View about Government Initiatives in Corona Pandemic Situation

As per Graph 7 55% of respondents are pleased with reduction in stamp duty of land & houses to boost the real estate. 23% pleased with 20% top up on loan (ELSS) through financial institution and 11% with Atmanirbhar Bharat and other initiatives.

Findings:

1) 30% respondents save 5-10% from their income. followed by 26% are saving 10-20% around 16% of respondents are having habit to save 20-30% and 30-40% each out their earnings.

2) 65% respondent preferred to save with fixed deposit. 52% in Systematic Investment Plan (SIP), 46.5% in mutual funds, 36% in insurance. in share market 21%. in gold 17% and in real estate 10%

3) 80% respondents manage their portfolio on their own. 15% has appointed portfolio manager and very few are taking advise from their friends & relatives for portfolio.

4) 73% respondents' saving objective is retirement plan, 59% respondent's saving objective is children's education and health care. Very few have responded for children's marriage.

5) Maximum respondents' spending's are affected due to Corona pandemic situation. Only 10% of the respondents' have no impact due to pandemic situation.

6) 21% of the respondents' have moratorium period due to Corona Pandemic situation.

7) 62% respondents are pleased with the Government initiatives and remaining 38% are not satisfied with Government Initiatives.

Conclusions:

1) COVID 19 pandemic situation has intense impact on the saving, investment and spending behavior of the individual.

2) COVID 19 pandemic situation has impact on savings of the individuals. Individuals have saved less as well as utilized existing savings. there are also some individuals whose savings has been increase due to decrease in spending's.

3) Maximum respondents are preferring to invest in Fixed deposits but at the same time respondents are also preferring modern investment avenues such as Mutual funds, SIP and share market in this pandemic situation. Less respondents are preferring to invest in gold.

4) People are adopting additional loan facility and moratorium period as they are facing financial problems due to COVID 19 pandemic situation.

5) The spending's of the individuals are embellished due to cut down in salary, decrease in petrol expenses. day outings. reduction in petrol and vehicle expenses.

6) Due to Government initiatives slowly. individuals are recovering from the COVID 19 pandemic situation.

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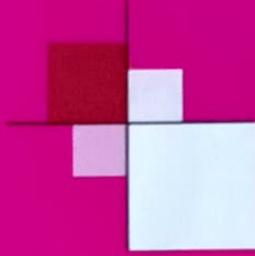
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A STUDY ON HUMAN RESOURCE ACCOUNTING & ITS IMPACT ON EMPLOYEE PRODUCTIVITY & GOODWILL OF MANAGEMENT INSTITUTES IN PUNE CITY

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Abstract
Various approaches have been developed so far for accounting human resources in various sectors and industry. Human resources also known as intellectual capital is one of the important resources of the organization. Human resource accounting is the process of identifying & reporting the investment in human resources of the organization and discloses the same to the parties interesting in knowing. Human resource accounting has aroused a lot of interest in the last decade. It has become an accounting component. This paper aims at quantifying & accounting of HR as Human assets in for the development of educational institutions as well as the society. To conduct this study four popular Management institutions namely Suryadatta institute of management & mass communication, Sinhagad Institute of Management, Indira College of management and Dr. D.Y. Patil Institute of management from Pune have been studied. The information has been collected by preparing questionnaire and getting opinion from employees as well as management in this concept. The analysis of the collected data shows that most of the employees and management people feel that human resource accounting should be introduced in educational institutions as it increases employee morale and Institute Goodwill.. Here chi square test, a statistical tool is used to prove hypothesis. The result depicts if human resource is introduced, it will have a positive impact on the goodwill, efficiency and productivity of teachers and the institutes.
Keywords- Human Resource accounting, Educational Institutes, employee productivity, Goodwill.

Introduction-
The major share in social and economic development of a country is contributed by its education system. Education lays a foundation by molding better and responsible citizens of a country. Education system involves huge investments and resources along with expert services, which reaps its benefits in long period. For any technical or knowledge based company, the major role is played by its intellectual workforce and highly skilled employees. Like any other knowledge based company , education institutes need highly talented and skilled personnel to achieve their goals. Teaching faculties are the real assets of any educational institutes. Human resources and be considered as human assets like other physical assets. It is therefore essential to recognize and account for human assets to obtain the real worth of an institution. Accounting of Human resource can result in enhancing the goodwill of the educational institute on one hand and increasing the efficiency and productivity of the human resource on the other hand. The paper opens the possibility window to account for human assets in management institutions in order to explore the hidden resources which contributes to the welfare of the institutions as well as the society. This study is based on primary and secondary data collected from questionnaire and other sources. A statistical tool, chi square test is used to prove the hypothesis and reach the conclusion.

Objectives of the study-

1. To find out feasibility of quantifying and accounting of human assets in educational institutions.
2. To find out its impact on productivity on teaching faculty
3. To find its impact on the goodwill of the institutions
4. To obtain views of the employees and management on this concept.

Tools for data collection

Primary data-

The primary data is collected by contacting total 50 people, including 40 employees and 10 management people of four selected management institutions in Pune city. Questionnaires are filled up asking relevant questions on the said theme.

Secondary data-

Secondary data is collected by refereeing to books, articles, research papers , journals and web links.

Significance of the study-

1. GAAP and Indian accounting standards do not currently have any provision regarding accounting for Human assets. The study can highlight some points for at least the discloser of human assets in the final accounts.
2. Human resource accounting can be used in India by only few selected companies, but no educational institute has so far explored this area.
3. Employees can be mapped according to their performance evaluation so that their physical cost and value can be known.
4. Suggestions can be imparted to IAS and IFRS to insert the discloser clause on HRA
5. Inputs of HRA in educational institute can be known such as knowledge, skills, motivation, recruitment, selection, training and development process.
6. There has been low acceptance and awareness of HRA due to lack of IAS for the same.

Limitations of the study

Following are the limitations of the study.

1. Due to time constraint the study is conducted from only four management institutions from Pune city.
2. The response received from the management was low.
3. This is futuristic concept where no specific system to quantify and account for human assets in educational institute is currently developed.

Discussion and Results-

Management institutions are considered as an esteemed place where the next generation management employees are being molded by the best experts and the technicians. This exemplary contribution of management faculties needs to be recognized and justified. Thus through this paper the impact of introduction of HRA may be recognized. In this paper the author has analyzed opinions from employees and management of 4 management institutions of Pune city with the help of questionnaire. A five point scale has been used to quest to arrive at a conclusion where 5 being the highest and 1 being the lowest. Table 1. **Representing the important items considered for educational institutions based on**

openion.

Ratings	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Campus & Facilities	12	29	5	1	3
Fees structure	32	9	4	3	2
Affiliation/ Private	18	7	22	3	0
Goodwill	18	14	8	6	4
Faculty Experience	35	10	3	2	0

Analysis-
The table shows the important items considered for academics. Most of the respondents agree that most important criteria in academics is faculty experience and fees structure followed by goodwill and whether the institute is private or affiliated to university & campus & other facilities.

Table 2. **Representing reasons to quantify & account for Human Assets based on openion.**

Ratings	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
It is a Capital Asset & should be recorded in Balance Sheet	10	09	10	07	14
An asset which can contributes in employee productivity	22	11	07	10	0
An asset which can contribute in increasing revenue	16	14	07	06	04
An asset which shows real worth	09	17	10	08	06
An asset which is long term	05	05	08	22	10

Analysis
The above table show varies reasons why Human Assets should be quantified and accounted. Most of the respondents have strongly agreed for Human asset to be recorded in balance sheet while none of the respondents disagreed to human assets increasing employee productivity. There were neutral responses on human assets showing real worth and it being a long term asset.

Figure –1, Graph representing the opinion of the respondents with regard to quantifying and accounting for human assets in educational institution:
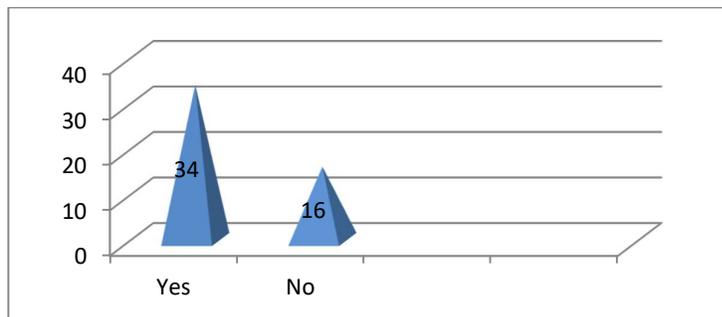
The above graph represents the opinion of respondents to quantify and account for human assets in educational institutions. Most of the respondents (employees and the management) have said that it is necessary to quantify and account whereas few feel it is not.

Table 3. **Representing the reasons given by the respondents who feel it is not necessary to quantify and account for Human Assets in academics**:

Particulars	No. of respondents
Difficult to quantify	12
Additional expense & time consuming	08
Unreliable information	10
Incorrect valuation	05
Misuse of information	09
IFRS, GAAP, IAS has no standard to calculate	10

Analysis

The above table represents the reasons given by the respondents who feel it is not necessary to quantify and account for Human Assets in academics. Different opinions and reasons have been raised by various respondents in this regard.

Graph-2 representing respondent's opinion on Positive Impact of HRA
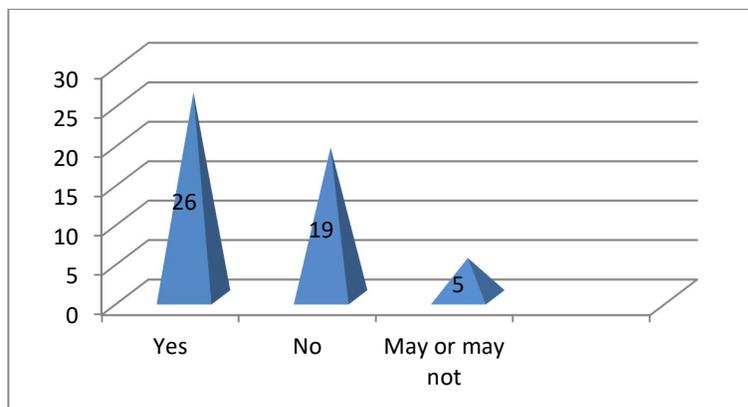
Inference

The above graph represents the respondent's opinion who agrees that HRA will create a positive impact on the teaching faculties (Positive impact being increase in efficiency, behavior patterns and better service to the society). This shows that most of the respondents (including employees and management) agree on this concept and few are not.

Figure-1- representing the respondent's opinion regarding increase in goodwill (reputation) of the institution by introducing HRA:
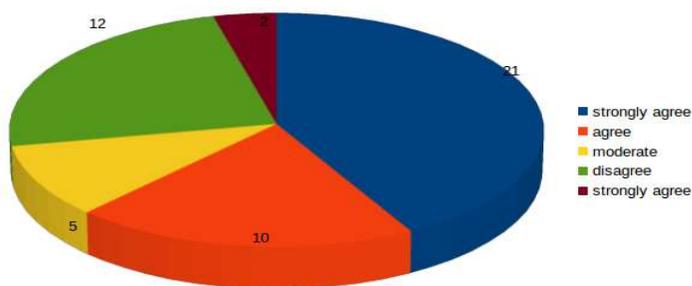
Inference

This graph shows the respondent's opinion regarding increase in goodwill (reputation)of the institution by introducing HRA. Here 5 of the respondents are moderate and 10 agree, 21 strongly agree on this whereas 12 disagree and 2 strongly disagree on this concept.

Graph-3- representing Impact of HRA in increasing goodwill
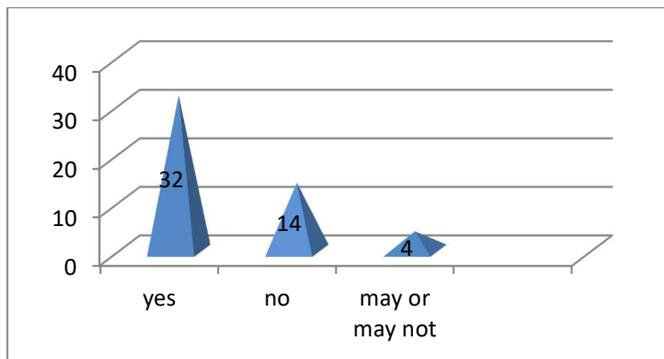
Figure –2 representing respondents opinion regarding HRA obtaining the real worth of an institution:
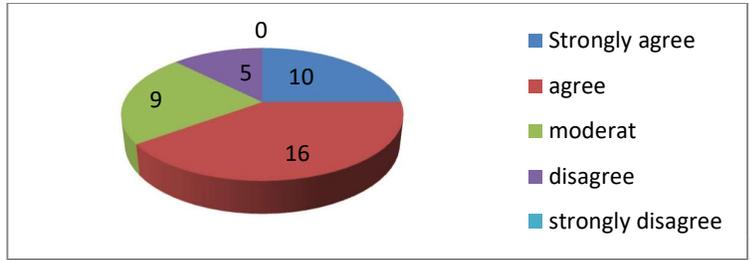
Inference

The above graph shows the number of respondents who have agreed that Human
Resources Accounting will help to know the real worth of an institution apart from otherf actors.(other
factors being infrastructure, reputation, placements ,course offered etc). Here 16 respondents have
agreed to this, 23 are moderate,6 strongly agree, and 5 disagee to this and no respondents strongly
disagreed to this concept

**Graph -4- indicating respondent's opinion on effect of HRA in obtaining real worth of the
Institution.**
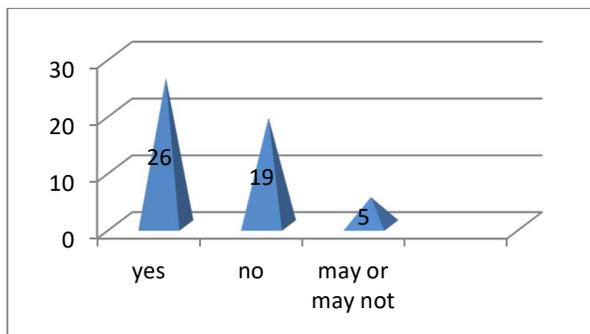
**Figure-5- representing Employee's opinion regarding Human Resources Accounting in
academics:**

Inference

The above graph represents the employee's opinion regarding Human Resources
Accounting in academics. Here most of the employees feel that system should be developed, introduced
in education institutions.

Figure-6- representing Management's opinion regarding Human Resources Accounting in academics:

Management's openion on Accounting of HRA in educational institutions
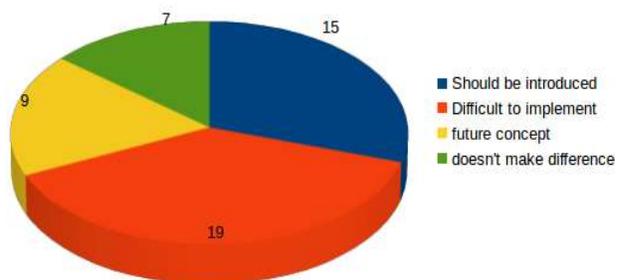
Inference

The above graph represents the Managements opinion regarding HRA in academics.
Here some management feels that system should be developed, introduced and in academics. Whereas
some of the management feels that it is difficult to implement and is a future concept.

Test for hypothesis

Chi square was the tool that has been used to test the hypothesis of the study. The variables that were
tested are:
1) Human Resource Accounting.
2) Positive impact.
3) Efficiency of the teaching faculties
4) Goodwill of the institution.
A) Ho-HRA will not have a positive impact on the teaching faculties.
B) Hi- HRA will have positive impact on the teaching faculties

Table- 4- Indicating positive impact on teaching faculties

Particulars	Observed N	Expected N	Residual (O-E)
Yes	26	16.67	9.33
No	19	16.67	2.33
May or may not	05	16.67	-11.67
Total	50		

The above table represents the respondent's opinion on positive impact of HRA on teaching faculties.

Out of 50 respondents 26 agreed and 19 disagreed where as 5 were neutral about their opinion

Test Statistics

.

Particulars	Positivity Impact
Chi-Square (a)	13.72
Degrees of Freedom	2
Asymp.Sig	0.000

The above table shows the Chi square value of 13.72 (df=2 , N=50), p< 0.5 is significant at 2 degree of freedom, showing that there is significant difference in expected and observed frequencies. As such we reject Null hypothesis and accept alternative hypothesis 1, that is, there will be positive impact on the teaching faculties.

Therefore we accept H1

B) Ho – There is no significant impact on increase in Goodwill

  Hi- There is significant impact on increase in Goodwill

Table- 5- Indicating significant impact on increase in Goodwill

Particulars	Observed N	Expected N	Residual (O-E)
Yes	32	16.67	15.33
No	14	16.67	-2.67
May or may not	04	16.67	-12.67
Total	50		

The above table represents the respondent's opinion on positive impact of HRA on teaching faculties. Out of 50 respondents 32 agreed and 14 disagreed where as 5 were neutral about their opinion

Test Statistics

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Particulars	Positivity Impact
Chi-Square (a)	24.16
Degrees of Freedom	2
Asymp.Sig	0.000

 The table above shows that Chi square value of 22.70 (df=2,N= 50), p<0.05 is significant at 2 degree of freedom, showing that there is significant difference in expected and observed frequencies. As such we reject Null hypothesis and accept alternative hypothesis 2, that is, there is significant impact of HRA on goodwill of the institute

Table- 6- Indicating effect of HRA in obtaining real worth of the institution

Particulars	Observed N	Expected N	Residual (O-E)
Yes	26	16.67	9.33

No	19	16.67	2.33
May or may not	05	16.67	-11.67
Total	50		

The above table represents the respondent's opinion on positive impact of HRA on teaching faculties. Out of 50 respondents 32 agreed and 14 disagreed where as 5 were neutral about their opinion

Test Statistics
.

Particulars	Positivity Impact
Chi-Square (a)	13.72
Degrees of Freedom	2
Asymp.Sig	0.000

The table above shows that Chi square value of 13.72 (df=2,N= 50), p<0.05 is significant at 2 degree of freedom, showing that there is significant difference in expected and observed frequencies. As such we reject Null hypothesis and accept alternative hypothesis 2, that is, there is significant effect of HRA in obtaining real worth of the institution.

Findings:
• Most of the employees including management have agreed that faculty proficiency is the most important factor in an academic institution.
• Most of the employees have rated infrastructure as the second highest apart from faculty proficiency. This means that infrastructure is also very important.
• The employees and the management feel that Human Resource are the value producing assets who help in the development of the society and help to obtain the real value of an institution for which they need to be quantified and accounted.
• Some of the respondents feel that quantifying and accounting is not necessary for educational institution as it is service oriented and would be an additional expense for the institution.
• Some of them also feel that institutions may over rate and manipulate the value of teachers just to increase the value of the institution.
• 52% of the respondents have agreed that introduction of Human Resource Accounting will create a positive impact on the teachers productivity.
• 64% of the respondents agree that there can be increase in goodwill of the institution by introducing HRA.
• 52% of the respondents have agreed that Human Resource Accounting will help to obtain the real worth of an institution. This shows that most of them agree to this concept.

Observations during discussions
Just as efficiency, there are arguments against increase in Goodwill of the institution.
  • Few feel that it depends on the institution and excellence of teachers. Few also feel that there can be other factors other than HRA

- Some feel that a concrete system need to be developed, tried tested and then implemented as it is a new concept.
- Some feel that through HRA people will be more accountable, focus on quality work and this enhances image. Some says that staffs, students, public & parents will have a participative role in the functioning and growth of the institution.
- Few respondents also say that the new concept itself brings fame.
- Some of the employees feel as there is no mandate from IAS, it is a futuristic concept. Some of the employees say that HRA is not required for educational institutes and very few stresses on HRA being an additional expense for the institution.

Conclusion-

Human Resource Accounting is no doubt a new and futuristic concept to be applied in educational institutes but it is true that when an institution accounts for physical assets then why not knowledge assets. Quantifying knowledge assets might seem to be difficult, expensive and time consuming task but if teachers are accounted as assets in educational institutions, then not only the teachers would be happy to contribute more and excel in the field as their worth is being shown to management and public but also that it will result into their motivation and enhancement in their skills which in turn will reflect in building the Goodwill of the institute & help in shaping tomorrow's citizens who in turn are going to serve the society at large.

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A STUDY ON ENVIRONMENTAL PROTECTION PRACTICES AND ITS DISCLOSURE OF SELECT AUTOMOBILE COMPANIES IN INDIA

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Abstract:
Environmental Protection Practices are a significant tool to understand the efforts taken by the business enterprises in the economy towards the environmental safety and welfare. It provides important information regarding the contribution of business enterprises in environmental wellbeing and the costs incurred in the form of pollution and resource degradation. Recently there has been rising concern for environmental degradation which is happening due to increasing industrial activities. The study is conducted in three selected automobile company in India over last three years to understand the environmental protection practices initiated by them and amount spent by them each year for the same and its impact on profit.

Key words:
Automobile Companies, Environmental Practices, Green Initiatives, Disclosure Policy

Introduction:
The developing countries like India are worried with problems of promoting economic development and protecting the environment at the same time. Manufacturing companies across the globe have realized the significance of energy protection with proper employment and measurement of cost and its benefit pertaining to total energy of all forms such as Electricity, Fuel, Gas, Conventional and Non-Conventional Energy purchased, consumed and stored. The issues like Corporate Social Responsibility and Sustainable Industrial Development have given rise to a new branch of accounting i.e. Environmental Accounting to show the costs and benefits gained by the corporate while using environmental resources. Hence environmental protection practices have become an integral part of corporate responsibility for almost all types of industries. Automobile companies are major contributor to the environmental pollution in India; hence they are expected to perform corporate social responsibility in the area of environment for the protection of the same. The practices followed by each automobile company are different. There is no uniformity in the environmental activities performed by them. Some companies fairly focus on low pollution vehicles, some make process simple and less complicated resulting in less pollution, some tale green initiatives as simple as ordering purchase form local vendor than from different city or state to reduce pollution.

Objectives of the Research Study:
Objectives of the research study are outlined as under:
1) To Review Government Rules and Regulations relating to Environmental Protection Practices, their accounting and disclosure for corporate bodies in India.
2) To Analyze Corporate Strategies towards Environmental Safety and Protection.

3) To Learn the Environmental Protection Practices followed by selected three Automobile Companies in India from their Sustainability reports
4) To Identify Green Initiatives taken by Automobile Companies for the last three years
5) To know the environmental discloser of these companies.

Significance of the Study:
The study is significant as environmental issues are of great concern at present. The major contribution in pollution is usually automobile companies. In India pollution is increasing every day whether it be air, water, noise or soil. The corrective and preventive steps in this direction must be taken to safeguard the interest of coming generation and keep environment clean and green. The study is significant as it will show the environmental protection initiatives by top three automobile companies in India.

Research Methodology:
The data is collected from secondary source by reading annual reports, environmental reports and sustainability reports of Tata Motors, Mahindra and Mahindra and Maruti Suzuki of the years 2017-18, 2018-19 and 2019-20. The data will be analyzed to understand the spending of each company towards environmental protection, its impact on profit and discloser of the same.

Data Collection:
The data is collected from secondary source i.e from annual reports, environmental reports and sustainability reports of three selected automobile companies. The financial figures are taken from the balance sheets of these companies and discloser analysis is done from annual reports of these companies.

Sample Size:
The data referred to is related to three major automobile companies in India and the data is analyzed for three years.
The automobile companies selected are-
1. TATA Motors
2. Maruti Suzuki
3. Mahindra and Mahindra

Data analysis for last three years-
1. 2016-17
2. 2017-18
3. 2018-19

Data Analysis and Interpretation:
I) **Study of Government Rules and Regulations relating to Environmental Protection Practices, their accounting and disclosure for corporate bodies in India.**
a) **Environmental Protection Laws in India:**
   - **Constitution and National Policies:**
     India took a bold step to include environmental protection rights and duties in its Constitution. The Constitution of India specifies that the State shall endeavor to protect and improve the environment and to safeguard the natural resources of the country. According to the Constitution, it is the fundamental duty of every citizen of India to protect and improve the natural environment and to have compassion for living creatures.

- **National Policies:** In addition to the Constitutional mandate, India has a number of national policies governing environmental management, including the National Policy on Pollution Abatement (NPPA, 1992) and the National Conservation Strategy and Policy Statement on Environment and Development (NCS/PSED, 1992).

b) **Legal Framework:**

India has an elaborate legal framework with over two hundred laws relating to environmental protection. Key national laws for the prevention and control of industrial and urban pollute include the following:

- Water (Prevention and Control of Pollution) Act of 1974, amended in 1988
- Water (Prevention and Control of Pollution) Cess Act of 1977, amended in 1991
- Air (Prevention and Control of Pollution) Act of 1981, amended in 1987
- Environment (Protection) Act of 1986 (EPA)
- Public Liability Insurance Act of 1991
- National Environmental Tribunal Act of 1995
- National Environmental Appellate Authority Act of 1997

The medium-specific legislation (the Air Act and the Water Act) up empower the central and state pollution control authorities to enforce emission and effluent standards for industries discharging pollutants into air and water. The Water Cess Act, among other things, stipulates the use of water for abstraction.

c) **Key Institutions:**

The primary institutions responsible for the formulation and enforcement of environmental acts and rules include the Ministry of Environment and Forests (MOEF), the Central Pollution Control Board (CPCB), State Departments of Environment, State Pollution Control Boards (SPCBs) and Municipal Corporations.

Ministry of Environment and Forests (MOEF): Established in 1985, the MOEF is the central government nodal agency responsible for planning, promotion and coordination of all environmental activities, including formulation of national policies, standards and regulations. The objectives of the MOEF are:

- conservation and survey of flora, fauna, forests and wildlife;
- prevention and control of pollution;
- a forestation and regeneration of degraded areas
- protection of the environment; and
- Welfare of animals.

Central Pollution Control Board: Under MOEF, the Central Pollution Control Board (CPCB) is the national board with oversight powers over state boards. The CPCB has a central office as well as a network of zonal offices located in New Delhi, Calcutta, Shillong, Kanpur, Bangalore and Vadodara. Established in 1977 under the Water Act, the CPCB has wide ranging powers and responsibilities to perform such other functions as prescribed by the central government.

State Pollution Control Boards: The SPCBs were established following the State Legislatures' adoption of the Water Act of 1974 and then the Air Act of 1981. At the State level, the SPCBs are attached either to the Environment Department, or to the Forest and Wildlife Department.

d) **Role of the Judiciary.** Over the last twenty years, the Supreme Court of India and some High Courts of the states have led the way in the enforcement of environmental laws through citizen-led public interest litigation (PIL) that has its legal basis in the constitutional right to a healthy environment.

II) Understanding Strategies and Environmental Protection Practices of Select Automobile Companies:

1) TATA MOTORS

TML in India drives all its initiatives on sustainability under the guidance of the Board committee on Safety, Health and Sustainability (SHS). All its operations are uniformly guided by the Tata Code of Conduct, which encompasses the principles of Reduce, Recycle, Recover and Refurbish. The Safety, Health and Environment (SHE) Councils at the business level, supported by the SHE Apex Committee at the plant level, are responsible for reviewing the performance every month. All TML plants are responsible for the implementation of energy, environment, and occupational health and safety management programmes.

Energy conservation measures have been undertaken across the seven manufacturing plants of TML. They comprise process improvements, instrument replacements, and installation of energy efficient equipment, among others.

➤ **Environmental Practice in FY 2016-17**
Vasundhara Project been undertaken by TATA Motors as they believe that forest wealth is dwindling due to overgrazing, over exploitation, encroachments, unsustainable practices, forest fire and unplanned urbanization. Their initiatives under the environment aim to promote environmental consciousness among communities especially students. They also promote large scale plantation drives and renewable energy applications and distributed among underprivileged community members who need them the most.

➤ **Environmental Practice in FY 2017-18**
They Launched hybrid buses for mass transportation and development of fuel efficient vehicles to reduce on-road fuel consumption and overall fleet emission; The Introduction of cleaner fuel CNG variants of the vehicles also helped reduce environmental load on ambient air quality and meet the product emission related regulations; The Introduction of emission control technologies across the Commercial Vehicle range that aid in superior performance, reliability, commercial affordability, environmental sustainability and future readiness of our vehicles. Use of Selective Catalytic Reduction (SCR) technology, enable TML meet the increasingly stringent emission norms; The Enhanced clean vehicles portfolio- TML has introduced more than 50 products with more than 200 variants including Ultra 1518, SIGNA 3718, Ace Gold and Starbus Hybrid. In addition to this, TML is gearing up with BS IV product/ technology superiority.

- ➢ **Environmental practice in FY 2018-19**

  JLR's latest project, REALITY builds on its long-standing work – 2016's REALCAR initiative – and found innovative ways to recover aluminum from end-of-life vehicles to build next-generation models. It used natural fibers and premium recycled materials to reduce environmental impact. Moreover, JLR's employees took an initiative to reduce the use of single-use plastics and managed to save more than 1,100,000 m2 of plastics going to the environment. Through this initiative, JLR also managed to save money and improve health and safety. For example, the GO I-PACE app uses Artificial Intelligence to help customers understand how the Jaguar I-Pace would fit their lifestyle. Safety of customer data is of utmost importance.

Energy Efficiency Difference

2016-17		2018-19	
Absolute Emissions (tCO$_2$)	Specific Emissions (tCO$_2$/VEHICLE)	Absolute Emissions (tCO$_2$)	Specific Emissions (tCO$_2$/VEHICLE)
2,66,200	0.56	60,533	0.13

2) MARUTI SUZUKI

- ➢ **Environmental Practice in FY 2016-17**

  Realize high fuel efficiency by adopting "SUZUKI GREEN Technology

  - Raise efficiency by improving the engine and drive system, and adopt new mechanism
  - Reduce the vehicle body weight by reviewing body structuring parts, changing materials, and reviewing manufacturing methods.
  - Reduce running resistance of the whole vehicle such as air resistance and rolling resistance.
  - Development of Next Generation Vehicles
  - Develop electric vehicles suitable for small cars.
  - Develop hybrid vehicles and electric vehicles for mini/ compact cars
  - Continue and promote local community cleanup activities, volunteering for environmental conservation (Suzuki Manner Improvement Activities, Forest Conservation Activities in "Suzuki Forest", tree planting project at storm surge barrier in coastal zone of Hamamatsu City, cleanup activities at individual offices, etc.).

- ➢ **Environmental Practice in FY 2017-18**

  - Development of next-generation vehicles (electric and fuel-cell vehicles)
  - CO$_2$ reduction in production
  - Expansion of solar power generation

- ➢ **Environmental Practice in FY 2018-19**

  - Environmental conservation is promoted in accordance with the "Suzuki Global Environment Charter" through the business activities and products in order to achieve a society with sustainable development.

Environmental Audit:

At Suzuki's domestic plants and the Group manufacturing companies, an external audit is conducted once

every year by an external auditing agent. In addition, an internal audit is conducted to double-check the environmental management system.

Environmental Accounting and Environmental Conservation:

Environmental Costs	Costs (In lacs)			FY 2018 (In lacs)		
Costs / Year	FY 2015	FY 2016	FY 2017	Investment	Expenses	Total
Pollution Prevention	5.0	4.8	4.3	6.9	4.4	11.3
Environmental Conservation	2.7	4.6	4.4	1.6	4.6	6.1
Recycling of Resources	3.1	1.9	-O.2	3.8	5.8	9.6
Total	10.8	11.3	8.4	12.2	14.7	26.9
Upstream / Downstream Costs	0.1	0.2	0.2	0.0	0.2	0.2
Managerial Costs	4.2	3.8	4.7	0.0	5.6	5.6
Research and Development Costs	504.9	519.8	529.7	58.8	497.6	556.4
Social Activities Costs	1.1	1.2	0.9	0.0	0.9	0.9
Environmental Damage Costs	0.3	0.4	2.5	0.2	0.4	0.7
Total	521.4	536.7	546.3	71.3	519.5	590.7

Development of Next-Generation Vehicles:
Development of Electric Vehicles:
Field test of 50 prototype electric vehicles started in India from October 2018. Testing of these vehicles helped to gather valuable insights as well as critical inputs based on customer perspectives and create a reliable and suitable electric vehicle to delight Indian customers.

Global average CO_2 Emission Amount of New Models:
In order to reduce CO_2 emissions, which is considered to be the main causes of global warming, Suzuki is making efforts in development and improvement of products by focusing on enhancing fuel efficiency.

3) MAHINDRA and MAHINDRA
Extensive work in energy saving has been done at Mahindra and Mahindra. 2 lakh lights have been replaced with LED with investment of 21 crore with CO2 saved upto 16400 tonnes.

Mahindra and Mahindra deployed 50 Electric Vehicles (EVs) on the Uber platform in Hyderabad. b83% green coverage at Igatpuri plant which brings about 50% reduction in the dust levels in the plant.

Mahindra and Mahindra enter the Limca Book of Records for planting a total of 16.4 million trees from 2007 to 2019 as part of the Mahindra Hariyali sustainability initiative.

➢ **Environmental practice in FY 2016-17**
  • Zaheerabad unit became the first plant in the FD to install a solvent recovery machine which processes this used thinner, collected in a drum post pushing and converts it into reusable material.
  • Through a simple process, 80% of the waste solvent is recovered and is reused for flushing and cleaning of the spray gun.

- ➢ **Environmental practice in FY 2017-18**
  - • A key milestone of Mahindra Electric's future technology roadmap, an 'Electric Vehicle'
  - • Innovation Centre' was inaugurated at Mahindra Electric, Bengaluru in July 17

- ➢ **Environmental practice in FY 2018-19**
  Water Positivity and Security
  - • 31% of the total water consumption was recycled and reused Igatpuri and Chakan plants running without dependency on external water sources
  - • Water recharge increased from 0.0322 million m to 0.10 million m

  Zero Waste and Circular Economy
  - • Eight locations across M and M are now certified as 'Zero Waste to Landfill' by M/s Intertek, USA
  - • Mahindra Kabira Festival 18 was a green, disposable plastic-free event. 96% of waste recycled, composted or reused

Green Initiatives:

1) TATA MOTORS
1. Reiterating its commitment to greener fuel options, the Company started delivery of electric buses to various State Transport Units.
2. The Company actively benchmarks its energy and environmental performance between our own Plants as well as peers and adopts best practices across Plant locations for maximum impact. All the Company's sites have obtained CII-GreenCo Rating, and 2 Plants have achieved Platinum rating in FY 2018-19.
3. The Company continued to drive a number of initiatives to reduce its environmental footprint in FY 2018-19. Th Green House Gas (GHG) mitigation approach includes driving Energy Conservation in manufacturing operations and generation / procurement of renewable energy
4. The Company also endeavors to mitigate all future risks related to technology by timely having appropriate emerging technology on Emissions, FE enhancement, Powertrain, Safety, connectivity, Infotainment, telematics, green initiatives etc., to meet and exceed all future emissions and vehicular safety norms
5. As part of its environmental stewardship (Vasundhara**)**, TML is making concerted efforts to increase green cover through sapling plantation on one hand, while enhancing the environmental awareness levels in the community on the other.

2) MARUTI SUZUKI
Maruti Suzuki concentrates on three major environmental policies.
1. **Suzuki Green Policy**
SUZUKI GREEN Policy represents Suzuki's environmental doctrine and policy, which includes environmental plan and guidelines.
2. **Suzuki Green Technology**
SUZUKI GREEN Technology represents next-generation eco-friendly technologies developed and

utilised by Suzuki, which includes new technologies such as low fuel consumption and weight reduction technologies.

3. **Suzuki Green Activity**

SUZUKI GREEN Activity represents Suzuki's effort and activity on realising the environmental policy, which includes various activities worked by each department such as development, production, and logistics for the control of global warming and promotion of environmental preservation.

Develop electric vehicles suitable for small cars

- For hybrid vehicles
  a) Developing improvements for Suzuki's unique hybrid system which combines driving motor with Auto Gear Shift.
  b) Developing new mild hybrid system.
- For electric vehicles
  a) Made 50 prototype electric vehicles based on Japanese production models at Maruti Suzuki and started public road testing in India from October 2018.

3) MAHINDRA and MAHINDRA

1. Make electric vehicles more accessible and best suited for Indian conditions. The launch of the e-Alfa Mini is yet another step to provide an emission free, green mode of safe intercity transport on in the country
2. Acting to reduce greenhouse gas emissions to zero - and then 'offseng' an equivalent amount of any remaining emissions.
3. Mahindra's carbon pricing leadership story featured in World Bank report
4. Inaugurated onsite solar power plant
5. Setting up bio-CNG plants
6. Promoting use of renewable energy and green initiatives to conserve natural resources.
7. purchasing energy efficient products as per green procurement policy and design for improving the energy performance throughout their life cycle
8. In October 2016, M and M became the first Indian company to launch an internal carbon price of $10 per metric ton to reduce the company's carbon footprint and help meet its goal of reducing its greenhouse gas emissions intensity by 25% by 2019 from 2015–2016 levels.
9. Mahindra Research Valley inaugurated its onsite 420 KW solar power plant to cater to a portion of its power requirement through green energy.
10. Various environment friendly programmes have been taken up under the banner, promoting green energy through collaboration with IITM's (Institute of Technology, Madras) Centre for Battery Operation (COE).

Table 1-
Major Environmental Protection Practices and Strategy of Automobile Companies Under Study:

TATA Motors	• Vasundhara Project- More tree Plantation • Launch of hybrid buses to reduce on-road fuel consumption • REALCAR initiative for innovative ways to recover aluminum from end-of-life vehicles
Maruti Suzuki	• Develop hybrid vehicles and electric vehicles for mini/ compact cars. • Expansion of solar power generation • Regular Environmental conservation, Environmental Accounting & Environmenal Audit.
Mahindra & Mahindra	• Installation of a solvent recovery machine to process used thinner and converts it into reusable material. • Establishment of Electric Vehicle Innovation Centre • 96% of waste is recycled, composted or reused

Table 2
Major Green Initiatives of Automobile Companies Under Study:

TATA Motors	Maruti Suzuki	Mahindra & Mahindra
• Green House Gass Mitigation • Tree plantation project • Greener Fuel Options	• Suzuki Green Policy • Suzuki Geen Technology • Suzuki Green Activities	• Mahindra's carbon pricing leadership story • Onsite solar power plant • Setting up bio-CNG plants

Table 3
Discloser Policy of Automobile Companies Under Study:

TATA Motors	Maruti Suzuki	Mahindra & Mahindra
• Annual CSR Report • Sustainability Report	• CSR & Environmental Report • Sustainability Report	• Annual Report • Business Sustainbility Report

Findings of the Study:

1) It is found that all automobile company under study follows government Rules and Regulations relating to Environmental Protection Practices, their accounting and disclosure
2) It is found that TATA Motors and Maruti Suzuki have long term strategy plans for restoration of Environmental Protection.

3) It is found that by following environmental protection initiatives, TATA Motor's energy efficiency has increased by 22.74%

4) It is found that total environmental cost of Maruti Suzuki has increased to 175% in FY 2018 as compared to FY 2017

5) It is observed that Mahindra and Mahindra Invested 21 crores to prevent CO_2 emission by replacing bulbs with LED lights

6) Mahindra and Mahindra planted 16.4 million trees as a part of environmental protection from FY 2007 to FY 2019.

7) It is found that all three automobile companies invested or took initiatives to engage in Green Initiative by various new projects and policies

8) All three automobile companies under study have disclosed environmental costs in the Annual Report/Sustainability Report of the company.

Suggestions:

1) Automobile companies should make long-term and short-term strategic plans for environmental protection practices.

2) Automobiles companies should take new green initiatives every year and involve stakeholders in the process.

3) Automobile companies should follow environmental policies and government laws strictly.

4) More companies should start disclosing environmental costs and practices followed.

Limitations of the Study:

1) The study is limited to only three automobile companies.

2) The study is restricted to three accounting years only.

3) The environmental practices and Green Initiatives followed by companies under study cannot be considered as uniform for all companies.

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An Eye for an Eye: The Female Gaze in Action in Jonathan Glazer's *Under the Skin*

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ABSTRACT

This research paper conducts an inquiry into an alternate narrative of female gaze in the Jonathan Glazer film *Under the Skin* (2014) through an alien-woman protagonist whose alienness puts patriarchal and gender binary concepts into perspective. The study investigates the heroine's alien ontological status which equips her with aggressive sexual agency arising from her hybrid and liminal identity. The analysis utilizes Julia Kristeva's notion of the abject, Mary Anne Doane's concept of the femme fatale, Lee Edelman's analysis of reproductive futurism and Laura Mulvey's concept of the male gaze to shed light on the pervasive masculine, heterosexual gaze in cinema and its many ramifications in the science fiction genre. The film represents an inversion of the cinematic construct of the omnipresent male gaze in action by replacing it with the female gaze and the threat it poses to hegemonic patriarchy.

Key Words: Female gaze, Male gaze, Abject, femme fatale, reproductive futurism

INTRODUCTION

The way we gauge the world through the collective speculum of a patriarchally stratified society has been sculpted from an insidious sexual imbalance that has conditioned the visual gaze in cinema to be overwhelmingly male. Not surprisingly, this has created a permanent fissure in the historical representation of women's experiences and realities on celluloid. The deep-seated pleasure of looking or in other words, scopophilia invoked in traditional cinema is a key concept defined by film scholar and theorist Laura Mulvey in her iconic 1975 essay "Visual Pleasure and Narrative Cinema." She elaborates on the notion of the male gaze as a mode of viewing that privileges men over women, where the woman is primarily utilized as a tool of visual consumption and treated as a by-product of heterosexual male desire. The woman is compulsorily a "spectacle" with aesthetic value and the man is necessarily the "bearer of the look" with women's authentic experiences taking a backseat over their sexualization and objectification. Decades of naturalizing the male gaze in music videos, television shows, films, internet, and other forms of media have conditioned society to accept the male gaze as the default mode of perception. This paper is an attempt to place the female gaze as a response to the male gaze and deconstruct the female gaze as a subversive strategy against the masculine and heterosexual gaze. I seek to evaluate an alternate narrative of female gaze in the film *Under the Skin* through the alien-woman protagonist whose alienness puts patriarchal and gender binary concepts in prospect.

Under the Skin (2014) is a science fiction horror film directed by Johnathan Glazer based on Michael Faber's novel of the same name. The Scottish Highlands with perennial overcast shadows

and misty hills sets the grim tone for the story that unfolds. The eerie geographical setting is a befitting choice, as the terrain is as mysterious and gloomy as the narrative. The alien protagonist slash serial predator is an anomalous black-hued life form from another planet, who along with her solitary motorbiking associate, is on a mission to harvest human flesh presumably to be used for their extra-terrestrial agenda of passing as humans. The alien female life form, brilliantly played by Scarlett Johansson, is disguised in an unknown woman's body whose identity is not revealed. The heroine's abduction plan consists of cruising the crowded streets of Glasgow in her van, scourging through unwitting male strollers who belong to diverse age groups and sizes, mostly glued to their cell phones. She lures the clueless men by initiating small talk and inviting them in the shady van using her seductiveness and physical attractiveness. The nameless protagonist usually leads with the line, "Do you think I am pretty?" which flatters the victims but also catches them by surprise. After a few unsuccessful attempts, she manages to pick up men and takes them to a dilapidated house where the men begin undressing while gradually stepping into a vicious black liquid abyss that swallows them and finally eviscerates their bodies.

2. THE HYBRID HEROINE

The unnamed heroine is a hybrid creature; an alien taking upon a female human form. The strange black alien mass is the product of a merger of a human carcass with an alien form which is echoed in Mary Ann Doane's words. The enigma of the nameless hybrid heroine is contained in the following words of Doane:

> Her most striking characteristic, perhaps, is the fact that she never really is what she seems to be. She harbours a threat which is not entirely legible, predictable, or manageable…
> transforming the threat of the woman into secret, something which must be aggressively revealed, unmasked, discovered. (1)

An amalgamation of animal and the corporeal, the heroine is as alluring as she is powerful in a suspense filled, horror set up that ultimately defines her as monstrous. Her unabashed routine drill of hunting down men is reminiscent of tigers hunting in a jungle, wandering around and smelling the fear of her victims. The consequent liminal and hybrid subjectivity results in the synthesis of the known and the unknown aspects of her mysterious identity. The transitory nature of her corporeality enables her to exist in a liminal space, occupying an in-between identity where transgressive couplings are left to the imagination. The sensory experience of the erotic, murderous theatrics transpires in this in-between space where terror and lust serenade each other. This mode of subjectivity is reminiscent of Julia Kristeva's notion of the abject which is described as a state of liminality located between two peripheral positions resulting in category breakdowns between human and non-human, raising alarms for the status quo of one's "corporeal reality". The heroine's puzzling corporeality creates a cognitive dissonance by placing the alien form within a female body which is desirable to the male, heterosexual eye yet turns into a source of anxiety for the male identity.

3.   THE ALIEN (FEMALE) GAZE

The story unfolds through an alienesque lens, forcing the audience to adopt an outsider's viewpoint that attempts to capture alien consciousness in its narrative. Very few films have been courageous to portray alien subjectivity but *Under the Skin* provides a brilliant rendition as it ingeniously enmeshes the alienesque with the feminine experience. The film narrative unfolds through the gaze of an alien observer which results in a thrilling and occasionally terrifying cross examination of human society. It can be argued it is the heroine's alien ontological status that equips her with the agency to act with absolute sexual aggression. A biological woman is incapable of exercising such freedom, partially due to the social conditioning she is subjected to from a young age, and partially due to the threat of violence lurking behind such behaviour. It is therefore not farfetched to conclude that the only scenario in which a woman might fathom getting away with being sexually brazen, is if she were a literal alien (Osterweil 47). The transformation of the heroine from an emotionless, cold killing machine, unafraid of retribution to an alien who comes to terms with her corporeal humanity and femininity, reveals the underlying message of the world we inhabit.

In the first half of the film, she moves like a swift predator, fearing no consequences, exercising her victimizing tactics and employs the female gaze unabashedly. However, her transformation meets an abrupt end when she begins empathizing with her victims and develops a connection with her material body, allowing the fatalistic male gaze to take control of her narrative. The more she begins connecting with her humanity and empathizing with her victims, the more she becomes vulnerable due to her status as a woman.

The Economist observed "there is some aggressive sexuality in the film: women seem very vulnerable but then men's desires are punished" ("Under her Skin"). Critic Leo Robson for *The Guardian* added, "In the society she enters, and to which she brings nothing besides a body, [she] is a sex object, in dress and demeanour a kind of sex toy; she might have come to Earth to prove a point about male expectations of women . . . If *Under the Skin* communicates any gender-politics message, it does so through the disparity in excitement between the male characters' reaction to [Johansson] and that of the camera." ("Scarlett Johansson in Under the Skin: 'prick her and she doesn't bleed).

The nameless heroine fits the femme fatale trope as she uses her sexuality and allure to destabilize gender relations and potentially threaten the human species. She subverts the sexual power dynamic by gaining control over male desire. The camera frequently lingers on her bright coral lips through the van's rearview mirror which is an interesting directorial choice. The sexual connotation of the coral lips makes her eligible for the role of a fetish object, inviting the unassuming men to fall for her physical allure, including her voluminous hair, pouty lips and strategically angled breasts. The heroine leads the men into a black lagoon of nothingness and watches their bodies disintegrate, carrying out a literal extinction of men.

She utilizes a crummy white van to pick up men, which is an interesting move as it subverts the

'sketchy white van' cliche, notoriously used to commit crimes against women. *Under the Skin*'s premise "creates a reverse of contemporary rape culture where violence against women is so common that women are casually warned to be ever alert for those who might harm them . . . By and large men don't worry about their safety in the same way when walking home late at night. But in the world of *Under the Skin*, they absolutely should" (Puchko, "Scarlett Johansson's Under The Skin Has A Special Message For Men).

　　She peruses the streets looking for the perfect victims, employing the female gaze in the role of the infamous voyeur looking through the windshield glass. The ubiquitous male gaze through which women are constantly subjected to, is subverted by the nameless heroine's purpose of looking at men as objects for pleasure. She zeroes down on her victims who are alone on the streets and pulls her van closer to the curb to ask for directions. This becomes her go to conversation-starter as she projects the image of the helpless damsel in distress in front of the male, to create the illusion of control. Theorist Barbara Creed's theory of the femme castrice is embodied in the protagonist who "arouses a fear of castration and death while simultaneously playing on a masochistic desire for death, pleasure and oblivion [in men]" (Chaudhari 102).
Screenwriter Walter Campbell refers to this as a "sexual trance" wherein "they are transported and their imagination is leading them on, and they are betrayed by their own instincts." Her agency and uninhibited disposition in selecting her sexual partners lead the men to fall into the seduction trap. The male gaze is clearly subverted through her operational strategy as she uses her sexuality to entrap men which has been historically used as a tool to suppress women. The male gaze has notoriously consumed the woman as a cultural sexual object but the protagonist uses her female gaze to literally consume the male victims she traps.

　　Literary scholar Ara Osterweil explores the heroine's experience of being an openly sexual woman wandering freely in the world, with no repercussions; a privilege that is not available to women without facing castigation or violence. However, the only way the heroine's sexual prowl comes to be justified is due to her alien status. The brazenness with which she flirts and propositions the men is met with a shock, both by the male victims and the audience simultaneously. Amidst a backdrop of traditional cinematic male gaze, the representation of the female gaze is a rarified phenomenon which makes the protagonist the ambassador for a unique feminist perspective. Not of the earth and without Edenic origins, the female alien is absolved of pathos or morality which qualifies her to immerse herself in games of desire without the slightest semblance of shame or morality. As Ara Osterweil notes, "how strange to experience the female gaze saturated with desire but unencumbered by care" (47).

　　The movie seems to substantiate the message that a woman must be a literal alien or an otherworldly being to be liberated from sexual codes of patriarchy. Film critic Leo Robson pointedly notes that Johansson's character is "both a watcher and predator of men. In the society she enters, and to which she brings nothing besides a body, [she] is a sex object, in dress and demeanour a kind of sex toy; she might have come to Earth to prove a point about male expectations of women . . . If *Under the Skin* communicates any gender-politics message, it does so through the disparity in excitement between the male characters' reaction to [Johansson] and that of the camera." ("Scarlett Johansson in Under the Skin: 'prick her and she doesn't bleed'").
A significant scene valuable to the conversation surrounding gaze is one when the heroine

undresses herself later. What lies 'under the skin' is not highlighted from a voyeuristic perspective and questions of her gender, identity and sexuality remain a mystery abruptly ending at the borrowed human skinsuit she dons. The male gaze is guilty of placing even the most complex female protagonists with motivations in scenarios that aid passive masculine gaze. However, undressing takes a peculiar turn in *Under the Skin*, when the heroine is taken in by the only hospitable man in the film. This gives her an opportunity to inspect her nude body up close in a full-length mirror. As she explores the nuances of her female body for the first time, she experiences acute awareness of her human identity as well as female identity. Scarlett Johansson, the voluptuous Hollywood star known for her husky voice and oozing sexuality, is shown completely naked in the scene; a scene which has the potential to trigger craze and furore among fans, but interestingly found no acknowledgement in mainstream media (Gittell, "Scarlett Johansson's Vanishing Act"). The voyeuristic aspect of the scene is removed as the alien woman delivers a performance where she is devoid of any personality thus, taking the sexual component out of the scene. The cameras do not resort to sneaky angles or strategically positioned nude scenes. Johannson makes the autonomy over her body quite clear by dominating the screen that communicates her command over her body to the audience The male gaze is averted as the nude scene barely registers a sexual undertone. The montage represents an inversion of the cinematic construct of the omnipresent male gaze in action, disrupted and inverted by the very object it seeks to objectify.

The cinematography and sound direction of the killing scenes lend a poetically haunting effect to the unfolding of events in the strange black room. The men walk towards an abyss following her as she undresses, and find themselves submerged in an unknown pool of liquid that swallows them up gradually. An underwater shot shows the atmosphere of a womb, except this womb-like environment, is a life-taker rather than a life-giver. The men's bodies shrivel up into brittle bones and a film of skin, finally reducing into a foetus-like object while the rest of the skin gets sucked into an alien red hot lava orifice. The entire process mimics the foetal development process in reverse; the men eventually being returned to their cellular existence, floating in amniotic fluid. As the femme fatale heroine alters sci-fi's obsession with reproduction, she substantiates anxieties surrounding human origins. The heroine's ability to reject the maternal shifts the focus towards her agency and intellect, making it the origin of her powers as well as the source of male anxiety.

One of the most impactful scenes takes place in the first half where she attempts to seduce a male Czech surfer on the beach. On the same beach, are a set of parents who end up drowning owing to a treacherous current while their infant sits unattended on the coast. The surfer tries to rescue them but is washed ashore instead. In a split second, the toddler becomes an orphan, wailing on an isolated beach while the heroine watches the events unfold indifferently. The surfer struggles for life but the nameless heroine decides to play god and ends his life by smothering him with a rock. The cries of the infant echo the lifeless beach but the alien heroine shows no signs of empathy or remorse. This heart-wrenching scene has no impact on her as she casually drags the surfer's body to her van, ignoring the helpless screams of the child. This scene is hard-hitting for the audience, especially because of the blatant lack of maternal instincts shown by a woman. Her gaze remains empty, unemotional, and animalistic, introducing her as the anti-maternal figure who only

views humans as the means to an end.

In his book, *No Future*, queer theorist Lee Edelman deconstructs reproductive futurism and the pervasive symbolism of the child as the basis of universal politics. The figure of the child becomes the beacon of hope for the future that has "unquestioned value and purpose" (4). How could one possibly be against fighting for the children? To see a woman behave nonchalantly towards a stranded child on barren land is evidence enough to banish a woman for being a selfish, abhorrent self-concerned female. The femme fatale imagery is typically typecast into the anti-maternal clan, as Mary Anne Doane in her book *Femmes Fatales* writes, "the femme fatale is represented as the antithesis of the maternal -- sterile or barren, she produces nothing in a society which fetishizes production" (2). A woman who declines the maternal loses her claim to humanity from the patriarchal purview.

Under the Skin triggers a conversation around the meaning of humanity, and more specifically femininity. The unfolding of events in the film sheds unflattering light on the current paradigm of gender politics i.e. to be a woman in this world is a dangerous game, one that comes with no guarantees. Although the heroine meets the stereotypical end of the femme fatale, she nonetheless dies giving an important message about female sexuality and female desire.

4. CONCLUSION

The film *Under the Skin* is a testament to the female gaze in existence which navigates the overcast streets of Glasgow from the unnamed woman's point of view while providing a commentary on what it feels like to be a woman in a man's world by inverting the all-familiar patriarchal equation. Although the protagonist uses her body and sexuality to stimulate the male gaze, she subverts the masculine, heterosexual gaze by deliberately using it to her advantage as a part of her overarching goal. The male gaze stems from an unconscious patriarchal desire to control the second sex but the protagonist's conscious choice of using her sexuality to lure men into their own traps takes away the scopophilic pleasure primarily involved in the male gaze. The film challenges the hegemony of the male gaze by not only providing a concrete example of the female gaze on screen but also deconstructs how the act of mere looking can spiral uncontrollably in a human society.

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Healthcare Misinformation Detection and Fact-Checking: A Novel Approach

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Abstract—**Information gets spread rapidly in the world of the internet. The internet has become the first choice of people for medication tips related to their health problems. However, this ever-growing usage of the internet has also led to the spread of misinformation. The misinformation in healthcare has severe effects on the life of people, thus efforts are required to detect the misinformation as well as fact-check the information before using it. In this paper, the authors proposed a model to detect and fact-check the misinformation in the healthcare domain. The model extracts the healthcare-related URLs from the web, pre-processes it, computes Term-Frequency, extracts sentimental and grammatical features to detect misinformation, and computes distance measures viz. Euclidean, Jaccard, and Cosine similarity to fact-check the URLs as True or False based on the manually generated dataset with expert's opinions. The model was evaluated using five state-of-the-art machine learning classifiers Logistic Regression, Support Vector Machine, Naïve Bayes, Decision Tree, and Random forest. The experimental results showed that the sentimental features are crucial while detecting misinformation as more negative words are found in URLs containing misinformation compared to the URLs having true information. It was observed that Naïve Bayes outperformed all other models in terms of accuracy showing 98.7% accuracy whereas the decision tree classifier showed less accuracy compared to all other models showing an accuracy of 92.88%. Also, the Jaccard Distance measure was found to be the best distance measure algorithm in terms of accuracy compared to Euclidean distance and Cosine similarity measures.**

Keywords—Misinformation detection; sentiment analysis; document similarity; fact-check; healthcare

I. INTRODUCTION

Online social media and the web as a whole have become the spring of information to users all around the world. Due to its convenience, feasibility, unrestricted access, and reasonable cost the internet have become popular amongst the community [1], [2]. The people read, share, write, and view the articles, blogs, news, videos, audios, etc., all over the internet. The rate of sharing articles, blogs, news, etc., has been accelerated dramatically. However, the users not only share immaculate information but also try to spread wrong or incorrect information either knowingly or unknowingly in a moment. This widespread misinformation has relentless consequences on individuals, commercial, health, government, and all other facets of society. The ramification of the misinformation is catastrophic and may lead to extermination. For example, the political disinformation spread during the 2016 USA presidential elections led to public shootings. These enduring consequences of misinformation contribute towards ferocious conflicts that are preventable otherwise [3], [4].

The internet has become the most popular and the first choice of the public to investigate health problems. However, people get misinformed with wrongly populated content. A famous and perfect example is the misconception among the public about the measles, mumps, and rubella (MMS) vaccine causing autism. Health misinformation is defined as "A health-related claim of fact that is currently false due to a lack of scientific evidence" [5]. The promulgated experiences of people over the internet or articles were written about certain diseases without knowing or verifying the fact or having a lack of evidence can cause health ruination of readers and thus can lead to complete desolation [6], [7]. The misinformation related to health can have hazardous effects on people's life directly, thus detecting misinformation in healthcare is a need of time [8]–[10].

Misinformation detection has become the topic of interest amongst researchers in the literature. The researchers have studied different types of false information. The first category is termed misinformation, which is the inaccurate or incorrect information that is confirmed with existing evidence [11]. The other categories include the fake news [12], [13], rumor [6], satire news [14], hoaxes [15], misinformation [16], [17], disinformation [18] and opinion spam [19]. To detect each of these categories of false information the authors have used several features like sentiment analysis, user-specific features, syntactical features, grammatical features, image or message specific features, etc. Also, there are readily available datasets for false information detection in various domains viz. politics, news, business, and healthcare. Few examples of these datasets are LIAR, FakeNewsNet, BSDetector, etc. With the help of features and datasets, machine learning and deep learning techniques are applied to detect false information [11]. However, detecting misinformation is an exhaustive task. This is due to two main reasons: first, is the availability of dataset in a certain domain and second is fact-checking of the data [11], [20], [21]. It is difficult to get the benchmark and gold-standard datasets in a specific domain. Also, manual fact-checking of data is time-consuming, requires expert guidance, and involves laborious tasks. Thus, automatic fact-checking of data is a need of time to endure with the speed of the newly arriving and changing data.

Document Similarity is a measure of the distance between the two documents (DS). There are several distance measures available in the literature to compute the similarity between the

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documents like Euclidian Distance, Cosine Similarity, Jaccard Distance, etc. The concept of document similarity can be used to fact-check the information with the existing verified documents and thus can help to detect misinformation. Document Similarity is a measure of the distance between the two documents (DS). There are several distance measures available in the literature to compute the similarity between the documents like Euclidian Distance, Cosine Similarity, Jaccard Distance, etc. The concept of document similarity can be used to fact-check the information with the existing verified documents and thus can help to detect misinformation.

Sentiment Analysis (SA) techniques to detect the polarity of data into positive, negative, and neutral have been widely used in the literature to detect misinformation, fake news, rumors, etc. The process of knowing the opinion of the people about the products, services, movie reviews, etc. can be easily captured using sentiment analysis [20], [22]–[26]. The literature related to misinformation detection or finding the credibility of information using sentiment analysis has marked that the articles or blogs containing more positive words are tend to be spreading true information while the articles having negative information contain more negative information [27], [28].

Thus, to detect misinformation and perform fact-checking automatically the authors have proposed a hybrid approach of sentiment analysis and document similarity. In this research paper, the authors have created a sentiment-based Bag-of-Words (BoW) as a dataset related to the healthcare domain. Further, features like sentiment analysis, grammatical and lexical features are used to detect misinformation and document similarity measures viz. Euclidian distance, Cosine similarity, and Jaccard distance are used to perform fact-checking.

The remaining sections of the paper are structured as follows: Section II provides the literature survey describing the techniques of using sentiment-based features to detect misinformation in the healthcare domain and also the document similarity-based approaches used to fact-check the documents which could help to detect misinformation in the healthcare domain. Section III describes the proposed model architecture, dataset collection and cleaning process, and methodology used in the proposed model. Section IV discusses the results generated based on the proposed model of a hybrid approach of sentiment analysis and document similarity and section V describes the conclusion and future enhancements.

II. RELATED WORK

A. Sentiment Analysis in Healthcare

In terms of web articles, the sentiment analysis is an expression that measures the attitude of the author in terms of positive, negative or neutral towards the article topic. Especially, when talked about healthcare-related articles, people like to express and share their opinions about their experiences about the disease which they have suffered from. Therefore the readers get biased towards the opinion of the author and believe the article without verifying the facts or evidence. Due to the rich contents of health information available online, the web has become the first choice of patients or users to know about the cure of disease and related remedies. Thus, understanding the sentiment of the article contents is much needed when it comes to misinformation detection. In the state-of-the-art techniques, the authors have analyzed the moods of cancer patients from tweets. Long Short Term Memory (LSTM) techniques were used to find the sentiments from the tweets [29]. In another research, authors collected 1,000 text comments of medical experts through various medical animation videos of the Youtube repository, and applied sentiment analysis to these comments to enhance the reputation of telemedicine education across the globe [30]. To study the effectiveness or popularity of a medicine, authors have performed sentiment analysis on public reviews using weighted word representation techniques and added linguistic constraints to model the contextually similar words [31]. Also, sentiment analysis techniques were used to detect misinformation in herbal treatments of diabetes in Arabic comments of YouTube videos [32]. The sentiment analysis is widely used in the healthcare sector to understand the sentiment polarity of the text and thus it can act as a major feature for misinformation detection. Table I displays the recent techniques of sentiment analysis in the healthcare domain in comparison with the proposed model techniques.

B. Document Similarity in Healthcare

Document similarity measures the distance between two documents in a numeric value. The document similarity measures are used to find the similarity between healthcare documents. For example, to detect medical codes of the documents the authors have used an attention mechanism which targets the most informative parts of the documents [33]. In another research, Jaccard distance measure was used to compute the similarity between medical documents using a Non-negative matrix factorization algorithm [34]. In another research, the Term Frequency-Inverse Document Frequency (TF-IDF) of a document is computed and document similarity is measure using cosine similarity, further k-means is used to cluster the documents of similar types. The authors have also used the Unified Medical Language System (UMLS) to extract domain-specific features and select the required features using Principal Component Analysis (PCA). Further, the authors have used expected maximization techniques to cluster the similar documents together [35]. The document similarity is extensively applied in the healthcare domain to group similar documents together. This technique along with sentimental features will be useful for detecting misinformation in the healthcare domain. Table II displays the recent techniques of document similarity in the healthcare domain concerning the proposed model.

TABLE I.   RECENT TECHNIQUES OF SENTIMENT ANALYSIS IN HEALTHCARE DOMAIN AND THE PROPOSED MODEL TECHNIQUES

Sr. No.	Reference	Technique	Dataset	Features	Sentiment Classification
1	[29]	LSTM	821,483 public tweets	N-gram, TF-IDF,LDA, PCA	Cancer Tweets
2	[30]	Classifiers used like SVM, kNN	1,010 comments	Sentiment	Medical Videos
3	[31]	Classifiers used like SVM, kNN	2,15,063 patient reviews	TF-IDF	Patient Reviews
4	**Proposed Model**	**Classifiers used like LR, SVM, NB, DT, RF**	**1000 Healthcare Web URLs**	**TF-IDF, Sentiment Polarity, Grammatical Features**	**Healthcare web URLs as True or False**

TABLE II.   RECENT TECHNIQUES OF DOCUMENT SIMILARITY IN HEALTHCARE DOMAIN AND THE PROPOSED MODEL TECHNIQUES

Sr. No.	Reference	Technique	Dataset	Distance Measure	Similarity
1	[33]	RNN, CNN, LR, RNNatt	59652 discharge summary notes, 344 Wikipedia pages	KSI (Knowledge Source Integration)	Clinical Notes
2	[34]	Classifiers used like SVM, CRF_based, Rule-Based and Aggregator	889 records of medication, 1237 of Obesity, 871 records of VA (each record is a medical document)	Jaccard Distance	Medical Documents
3	[35]	K-means	2673 medical prescriptions	Cosine Similarity	Clinical Notes
4	**Proposed Model**	**Classifiers used like LR, SVM, NB, DT, RF**	**1000 Healthcare Web URLs**	**Jaccard Distance, Euclidean Distance, Cosine Similarity**	**Fact-Check Healthcare Web URLs**

C. Sentiment Analysis and Document Similarity Approaches

The document classification can be best achieved using document similarity measures. The amalgamation of sentiment analysis and document similarity is effective in terms of document classification as found in the literature. The deep learning techniques along with cosine similarity measures are used to successfully classify documents related to stock news based on the sentiments in literature, resulting in the merging of most relevant documents together [36]. In another approach, One-Class Support Vector Machine (OCSVM) and Latent Semantic Indexing (LSI) were used to classify text documents into positive and negative [37]. In another approach, NET-LDA model was proposed to find the semantic similarity between documents using sentiment polarity and cosine similarity approaches [38]. There are three different types of measures followed in the literature for document similarity measurement viz. Jaccard Distance, Cosine Similarity, and Euclidean Distance. However, the authors didn't find any articles with document similarity measures used along with sentiment analysis to classify documents based on their similarity. Thus, the hybrid combination of document similarity and sentiment analysis is a novel approach and can be used to detect and fact-check healthcare related misinformation. Table III displays the recent techniques of document similarity and sentiment analysis and the proposed model techniques

D. Document Similarity and Fact-Checking

The major challenge faced in detecting misinformation is performing the fact-checking of data as there fewer benchmark datasets available specific to a certain domain like healthcare. With the enormous amount of information generated online, it is a highly challenging task to perform manual fact-checking of individual articles or blogs available online. Therefore the recent tools and techniques are automated using features from the text like sentimental features, user-specific features, grammatical features, etc. In the literature, authors have used techniques like Term Frequency Inverse Document Frequency (TF-IDF), and cosine similarity measures with k-means, Support Vector Machine, and Multilayer Perceptron to detect credibility of Indonesian news. Also, in another research, Latent Dirichlet Allocation (LDA) and Jaccard distance measures are used to detect fake news on the Buzzfeed dataset. In research to collect evidence for fake news detection word embeddings were used followed by Word Mover's distance measure to measure the similarity between the documents. However, it was observed that Word Mover's distance is very expensive for a large amount of data [39]–[42]. Table IV displays the recent techniques of detecting misinformation using document similarity and sentiment analysis. Though there are few studies handling fact-checking using document similarity measures, not major work is carried out in this field. Thus, in this paper, the authors propose a model with a hybrid combination of sentiment analysis and document similarity approach to detect and fact-check the misinformation.

TABLE III.   RECENT TECHNIQUES OF DOCUMENT SIMILARITY AND SENTIMENT ANALYSIS AND THE PROPOSED MODEL TECHNIQUES

Sr. No.	Reference	Technique	Dataset	Features	Distance Measure	Application
1	[36]	Deep Neural Network	62,478 articles related to stock	Sentiment Polarity	Cosine Similarity	Stock Market News Similarity Estimation
2	[38]	NET-LDA	1518 Turkish reviews and 1K from amazon	Sentiment Polarity	Cosine Similarity	Merge semantically similar documents
3	**Proposed Model**	**Classifiers used like LR, SVM, NB, DT, RF**	**1000 Healthcare Web URLs**	**Sentiment Polarity and Grammatical Features**	**Jaccard Distance, Euclidean Distance, Cosine Similarity**	**Detect and Fact-Check Healthcare Web URLs**

TABLE IV.   RECENT TECHNIQUES OF DETECTING MISINFORMATION USING DOCUMENT SIMILARITY AND SENTIMENT ANALYSIS

Sr. No.	Reference	Technique	Dataset		Features	Distance Measure	Application
1	[39]	K-Means, SVM, Multilayer Perceptron	9038 Fake news titles & 1069 Fact titles		TF-IDF	Cosine Similarity	Credibility Measurement of Indonesian News
2	[40]	Nil	Buzzfeed News		LDA	Jaccard Distance	Detect Fake News
3	[41]	Nil	Self-curated dataset		Word Embeddings	Word2Vec and Word Mover's Distance	Evidence Retrieval for Fake News
4	**Proposed Model**	**Classifiers used like LR, SVM, NB, DT, RF**	**1000 Healthcare Web URLs**		**Sentiment Polarity and Grammatical Features**	**Jaccard Distance, Euclidean Distance, Cosine Similarity**	**Detect and Fact-Check Healthcare Web URLs**

III. PROPOSED MODEL

A. Model Architecture

The proposed model architecture for misinformation detection in the healthcare domain and performing fact-checking automatically is shown in Fig. 1. Sections B, C, and D describe in detail the architecture building. Section B talks about the data collection method, section C describes the features extracted and used for model building in detail, and section D explains the process of working model.

B. Dataset Creation

The authors have crawled 60 URLs from the web on the healthcare domain and classified them as True and False with the help of expert opinion. This dataset is used to verify and classify other URLs from the healthcare domain. Further, authors have crawled 898 web URLs related to the healthcare domain. Out of which, 280 URLs are used for training the model and 618 URLs are used for testing purposes. These 1000 URLs are the combination of true and false URLs in the healthcare domain and are classified with the help of document similarity measures, sentimental features, and grammatical features along with machine learning techniques.

C. Feature Extraction

There are mainly three different types of features extracted from the URLs datasets. First, the authors focus on sentimental features which include a number of positive word count, number of negative word count, percentage of positive and negative word counts, and the total number of words. In a research to find sentiments of people in a covid-19 pandemic, authors have created a large benchmark dataset based on tweets generated on the twitter [43]. Thus sentimental features are crucial in healthcare domain. In grammatical features, authors have extracted noun, pronoun, verb, and adjectives from the URL text. The third type of feature is document similarity measure. There are three measures used in this paper to fact-check the URLs with manually classified web URLs related to

healthcare. The first is Euclidean Distance, which measures the straight line distance between two points in Euclidean space. Equation1 depicts the Pythagorean formula to compute the Euclidean distance between two points x and y [44].

$$d(x, y) = d(y, x)$$
$$= \sqrt{(X_1 - Y_1)^2 + (X_2 - Y_2)^2 + \cdots + (X_n - Y_n)^2}$$
$$\sqrt{\sum_{i=1}^{n}(X_i - Y_i)^2} \tag{1}$$

In this paper, the authors have used Euclidean Distance (ED) measure as a feature computed separately for true and false URLs. The other distance measure used is Jaccard Distance (JD) measures the similarity between two documents by finding the ratio of the size of the intersection and size of the union. Equation2 shows the formula to compute Jaccard Distance between two documents to find the similarity between the documents [44].

$$J(A, B) = \frac{|A \cap B|}{|A \cup B|} = \frac{|A \cap B|}{|A| + |B| - |A \cap B|} \tag{2}$$
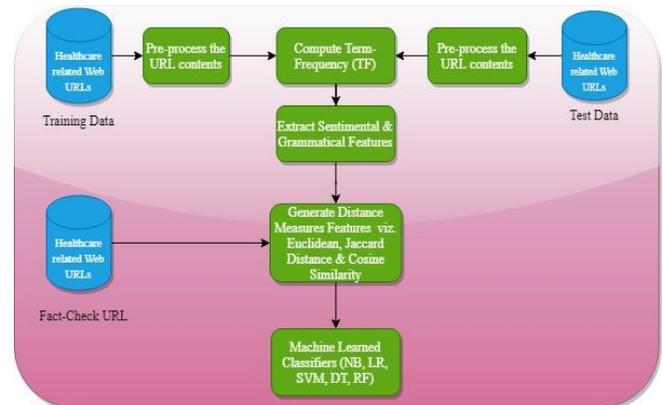

Fig. 1.   Proposed Model Architecture for Misinformation Detection and Fact-Checking.

Another document similarity measure is the cosine similarity measure. Cosine similarity computes the cosine angle between the vectors. It is represented by the dot product and a magnitude between the vectors. Equation3 shows the formula to compute the cosine similarity between two documents A and B [44].

$$\cos(\theta) = \frac{A.B}{||A|| \; ||B||} \qquad (3)$$

In this paper, authors have used Euclidean, Jaccard, and Cosine similarity measures as features to perform fact-checking of the URLs and thus detect misinformation in the healthcare domain. Table V lists the final set of features used in the proposed model.

TABLE V.   LIST OF ALL THE FEATURES USED IN THE MODEL

Sr. No	Feature Name	Description
1	Pos_count	Positive count
2	Neg_count	Negative count
3	Per_pos_count	Percentage of a positive count
4	Per_neg_count	Percentage of a negative count
5	Total_count	Total number of words
6	Noun	Noun
7	Pro-noun	Pro-noun
8	Verb	Verb
9	Adjective	Adjective
10	ED_T	Euclidean Distance for True URLs
11	ED_F	Euclidean Distance for False URLs
12	JD_T	Jaccard Distance for True URLs
13	JD_F	Jaccard Distance for False URLs
14	C_T	Cosine Similarity for True URLs
15	C_F	Cosine Similarity for False URLs

D. Working Model of Misinformation Detection and Fact-Checking

In the proposed model, the training dataset is first pre-processed to remove punctuations, stop-words, numeric data, duplicate data, etc. This is required to get the cleaned data for the execution of the model. After pre-processing the URL contents, Term-Frequency (TF) is computed to find the count of terms from the URL textual contents. This term-frequency is stored in the CSV file for future use. The next step is to generate features. The first type of features is sentimental feature that focus mainly on the polarity in terms of positive and negative words of the textual contents from the URL. This is computed to the TF generated in the previous step. Along with sentimental features, grammatical features are also retrieved like noun, pronoun, verb, and adjectives. In misinformation detection, sentimental features play a significant role. It was detected that a text containing misinformation generates more negative words compared to positive words and vice-versa. Thus, more negative sentiments can lead to misinformation [17]. Thus, sentimental features and grammatical features together help to detect misinformation in this proposed model. The next aim is to perform automatic fact-checking of newly arriving URLs from the test dataset. For this reason, a fact-check URL dataset is generated. Fact-

Check URL dataset contains manually fact-checked URLs from healthcare-domain classified into True and False. To perform fact-checking of URLs from the test dataset, the authors have used standard distance measures like Euclidean Distance, Cosine Similarity, and Jaccard Distance as features. Therefore, every URL from the test dataset is first pre-processed to clean the data, term-frequency, and sentimental features are generated and finally, distance measure features are created using the standard formulas explained in section C. To compute the distance measures URL from test dataset is matched with URL from the fact-checked dataset of URLs which gives two numeric values viz. numeric value for distance between true URL from the fact-checked dataset and second numeric value with False URL from the fact-check dataset. These two values are compared and the minimum value is considered as a final feature value. This process is repeated with every URL from the test dataset and for every distance measure. When all the features are generated, machine learning classifiers are applied to test the accuracy of the model. Authors have used five machine learning state-of-the-art classifiers from the literature viz. Logistic Regression (LR), Support Vector Machine (SVM), Naïve Bayes (NB), Decision Tree (DT), and Random Forest (RF).

IV.   RESULTS AND DISCUSSION

This section explains the experimental results carried out to evaluate the performance of the model. The proposed methodology is evaluated on five different state-of-the-art classifiers namely LR, SVM, NB, DT, and RF. Section A displays the performance matrix of the model in terms of Accuracy, Precision, Recall, and F1-Score based on the three different parameters viz. Jaccard distance, Euclidean distance, and Cosine similarity distance measures and contains the confusion matrix for the NB classifier. Section B explains the word clouds generated to show the words related to true information and false information from the URLs and Section C explains the analysis of misinformation detection.

A. Performance Matrix

The performance matrix is measured in terms of accuracy, precision, recall, and F1-score. Fig. 2 shows the accuracy of the proposed model based on 5 different classifiers. It was observed that NB outperformed all other models in terms of accuracy showing 98.7% accuracy whereas the decision tree classifier showed less accuracy compared to all other models showing an accuracy of 92.88%.

Fig. 3, Fig. 4 and Fig. 5 display the precision matrix, recall, and F1-score of the proposed model on various classifiers using three parameters viz. Jaccard Distance, Euclidean Distance, and Cosine Similarity measures. Table VI, Table VII and Table VIII display the performance of the distance measure technique used in terms of accuracy, precision, recall, and F1-Score per machine learning classifier. It is observed that the Jaccard Distance Measure showed maximum accuracy compared to other distance measures with maximum accuracy of 98.71% for the Naïve Bayes classifier whereas the Cosine similarity measure showed minimum accuracy of 88.19% with the Decision Tree classifier model. Euclidean Distance measure showed average accuracy in comparison with other distance measures.
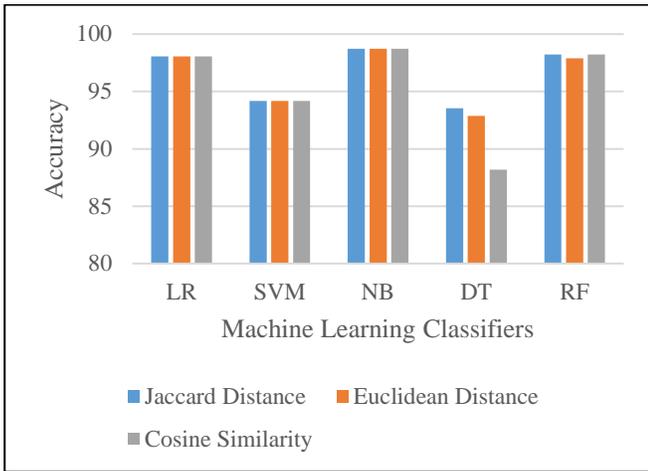
Fig. 2. Performance Matrix in Terms of Accuracy (in Percentage).

Fig. 3. Performance Matrix in Terms of Precision (in Percentage) of the Proposed Model.

Fig. 4. Performance Matrix in Terms of Recall (in Percentage) of the Proposed Model.

Fig. 5. Performance Matrix in Terms of F1-score (in Percentage) of the Proposed Model.

TABLE VI. PERFORMANCE MATRIX OF JACCARD DISTANCE MEASURE (IN PERCENTAGE) OF THE PROPOSED MODEL

Jaccard Distance				
	Accuracy	Precision	Recall	F1-Score
LR	98.06%	99.78%	97.62%	98.69%
SVM	94.17%	99.31%	92.87%	95.98%
NB	98.71%	99.56%	98.70%	99.13%
DT	93.53%	99.76%	91.58%	95.50%
RF	98.22%	99.56%	98.06%	98.80%

TABLE VII. PERFORMANCE MATRIX OF EUCLIDEAN DISTANCE MEASURE (IN PERCENTAGE) OF THE PROPOSED MODEL

Euclidean Distance				
	Accuracy	Precision	Recall	F1-Score
LR	98.06%	99.78%	97.62%	98.69%
SVM	94.17%	99.31%	92.87%	95.98%
NB	98.71%	99.56%	98.70%	99.13%
DT	92.88%	99.76%	90.71%	95.02%
RF	97.90%	99.78%	97.41%	98.58%

TABLE VIII. PERFORMANCE MATRIX OF COSINE SIMILARITY MEASURE (IN PERCENTAGE) OF THE PROPOSED MODEL

| Cosine Similarity				
	Accuracy	Precision	Recall	F1-Score
LR	98.06%	99.78%	97.62%	98.69%
SVM	94.17%	99.31%	92.87%	95.98%
NB	98.71%	99.56%	98.70%	99.13%
DT	88.19%	92.39%	91.79%	92.09%
RF	98.22%	99.78%	97.84%	98.80%
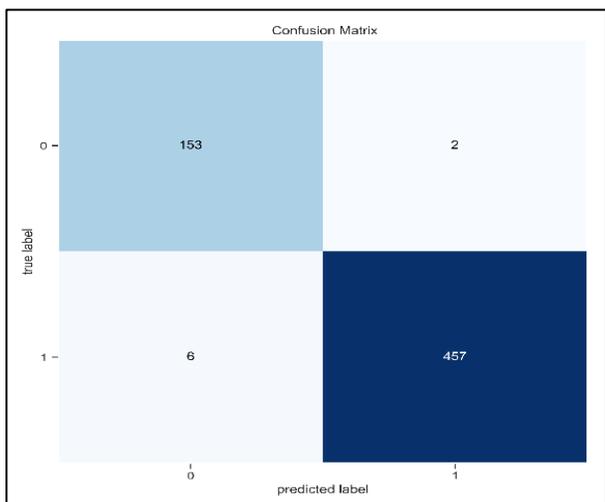
Fig. 6.   Confusion Matrix for Naïve Bayes Classifier using Parameters as Euclidean Distance, Jaccard Distance & Cosine Similarity Measure.

Fig. 6 shows the confusion matrix for Naive Bayes classifier. It can be seen from the confusion matrix that 457 samples are correctly classified as true positive, whereas 153 samples are classified as true negative. False-positive and false-negative sample values are 2 and 6, respectively.

B. Word Clouds

Fig. 7 and Fig. 8 displays word clouds of URLs having misinformation and legitimate information respectively. It can be seen that the URLs having misinformation contain more negative words like death, false, etc. whereas URLs with true information contain more positive words like well, symptom, increase, etc. This shows that sentiment analysis can play a vital role in detecting misinformation.
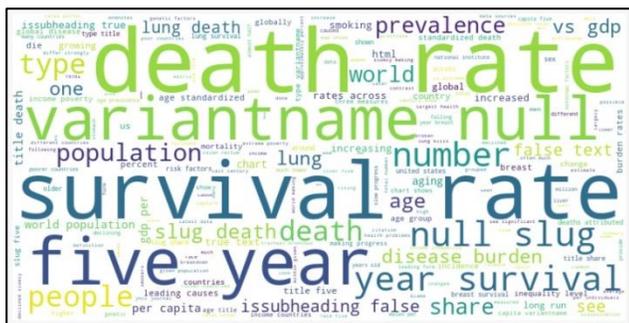

Fig. 7.   Word cloud for URLs having Misinformation.

Fig. 8.   Word Cloud for URLs having True Information.

C. Analysis of Misinformation Detected

Fig. 9 displays the average percentage of misinformation and true information in the web URLs. It can be seen from Fig. 9 that for around 200 URLs the percentage of misinformation is high compared to true information and it is at a peak for URLs ranging from 200 to 300. Fig. 10 displays the average count of positive and negative words in the URLs classified as True. It is been observed that the average positive count of words is 71% in True URLs and the negative count is 29%. Fig. 11 displays the average count of positive and negative words in the URLs classified as False. It is been observed that the average negative count of words is 62% in False URLs and the positive count of words is 38%. Thus, the authors found that for URLs with misinformation the average count of negative words is more and positive words are less. Therefore, sentiment analysis is an important feature to detect misinformation in web URLs.
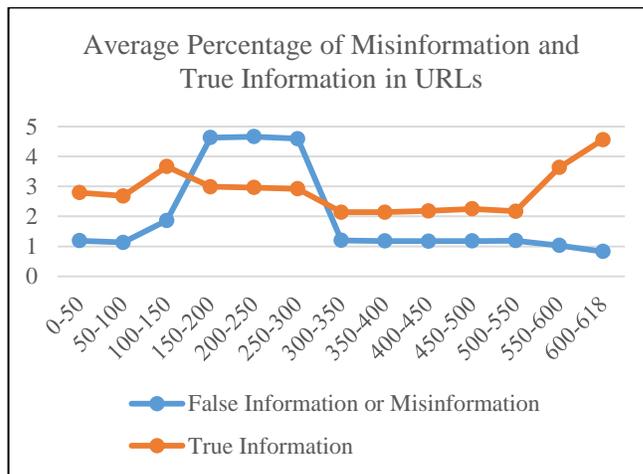

Fig. 9.   A Graph showing the Average Percentage of Misinformation and true Information in URLs.
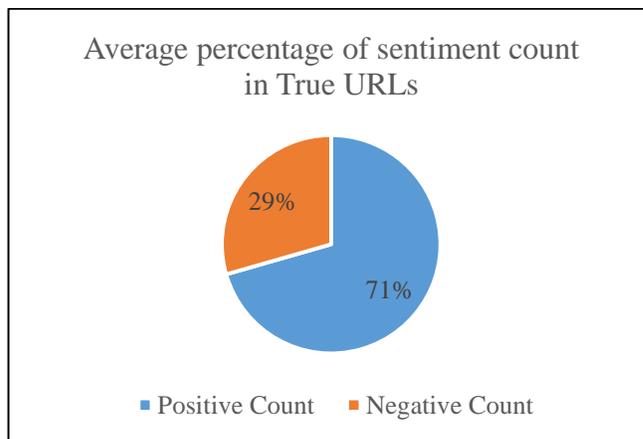

Fig. 10. A Graph showing the Average Percentage of Positive and Negative Counts in True URLs.
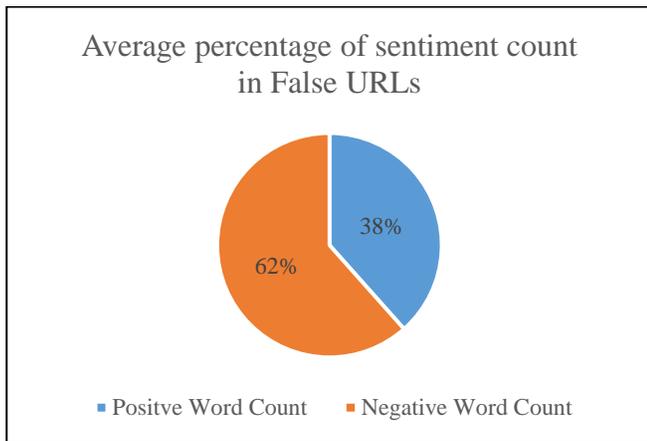
Fig. 11. A Graph Showing the Average Percentage of Positive and Negative Counts in False URLs.

V. CONCLUSION AND FUTURE WORK

In this research, authors have proposed a model to detect and fact-check misinformation in the healthcare domain. The fact-checking of URLs using distance measures improves the performance of the model than standard techniques of manual fact-checking of data. It was observed that the sentimental features are crucial while detecting misinformation as more negative words is found in URLs containing misinformation compared to the URLs having true information. It was observed that NB outperformed all other models in terms of accuracy showing 98.7% accuracy whereas the decision tree classifier showed less accuracy compared to all other models showing an accuracy of 92.88%. Also, the Jaccard Distance measure was found to be the best in terms of accuracy compared to Euclidean distance and Cosine similarity measures. In the future, authors want to collect more URLs and observe the difference in the accuracy of the model. Also, the authors want to identify the spreaders of misinformation by keeping track of the percentage of misinformation containing in the text published by these authors.

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